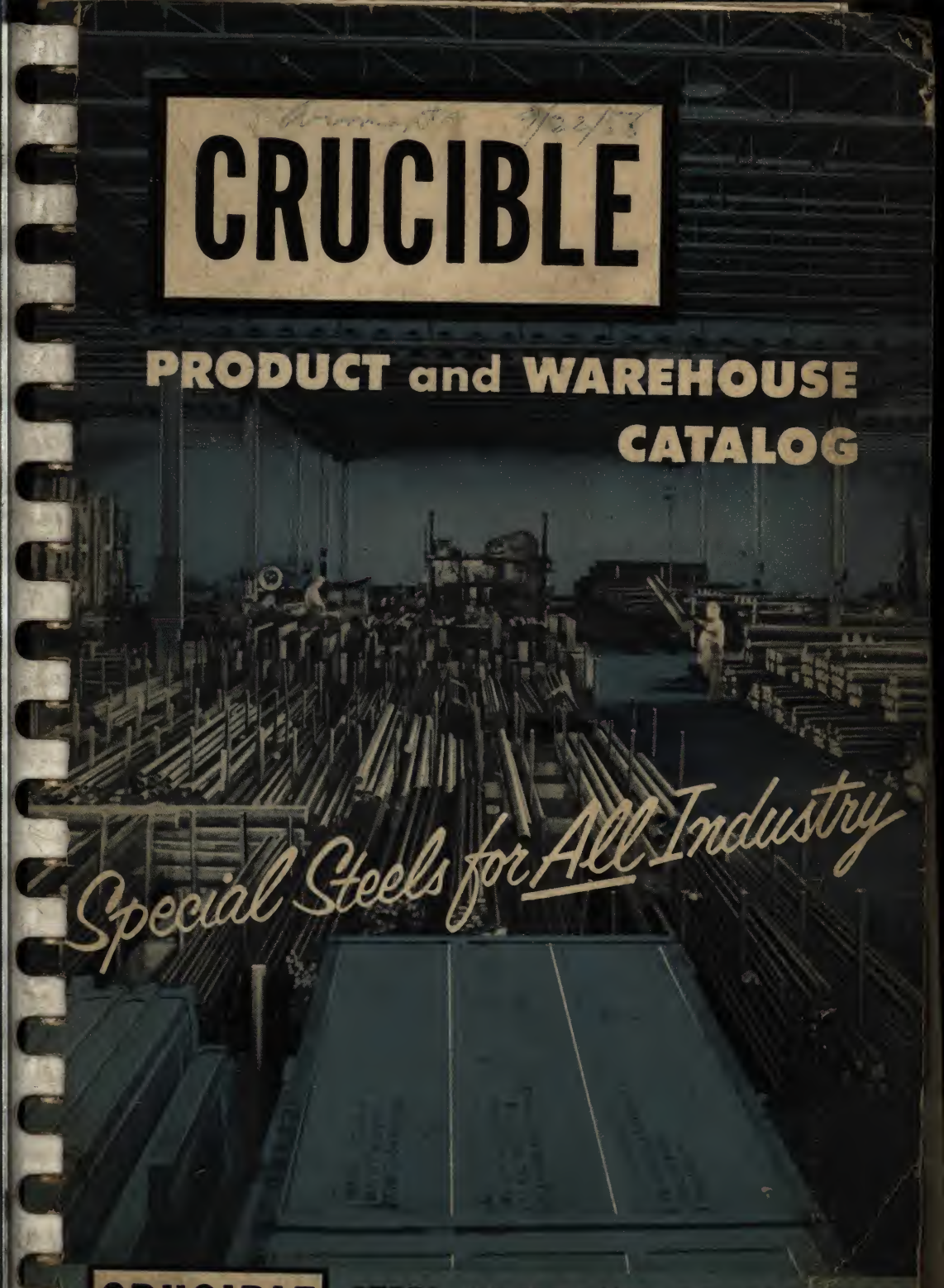
CRUCIBLE

PRODUCT and WAREHOUSE CATALOG



CRUCIBLE STEEL COMPANY OF AMERICA
THE OLIVER BLDG. · MELLON SQUARE · PITTSBURGH 22, PA.

Comments
9/22/58

V EL/A

CRUCIBLE

PRODUCT and WAREHOUSE CATALOG

Special Steels for All Industry

CRUCIBLE STEEL COMPANY OF AMERICA

THE OLIVER BLDG. • MELLON SQUARE • PITTSBURGH 22, PA.

SPAULDING CAST PRODUCTS

TOOL STEELS

HIGH SPEED

PLASTIC-DIE CASTING

AIR HARDENING

HOT WORK

We Are Ready to Serve You

CRUCIBLE'S 28 warehouses, located throughout the country, stand ready to meet your every specialty steel requirement. High Speed, Tool, Stainless, Alloy, Machinery and Special Purpose steels, in a wide range of types, tempers, and sizes are carried in stock for fast delivery to your plant.

This book is designed to show you at a glance the complete range of grades and sizes available from stock. In the event that a specific grade or size is not available from your local Crucible branch, it will be rushed to you from another branch in the vicinity.

Your Crucible Warehousemen are there to serve you. Specialists, with years of experience in the proper application and handling of quality steels, these men can help you with your steel problems. Available to you, too, are the services of highly trained Service Engineers and Metallurgists located at our mills. Working in modern testing laboratories, and with a wealth of data at their finger tips, these men can be helpful in unravelling the tougher problems you may encounter from time to time. And all of this service is no farther away than your telephone.

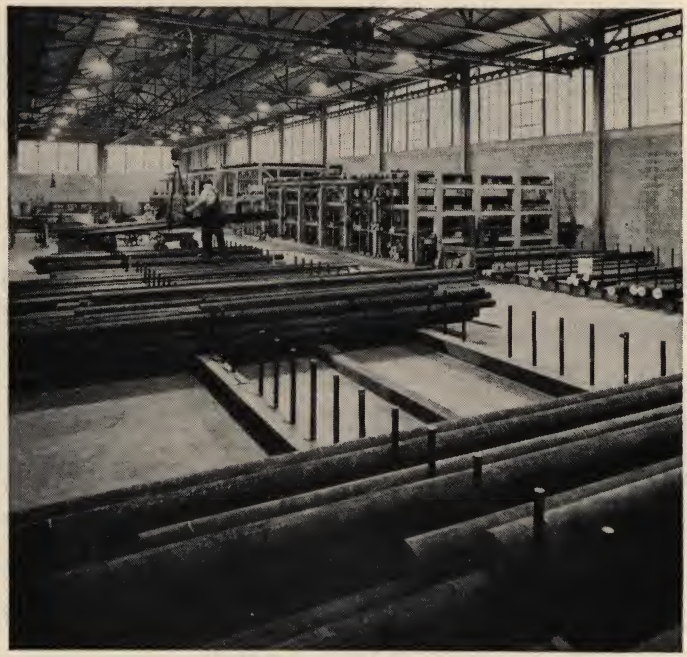
•

Data sheets showing the application, suggested heat treatment and metallurgical information are available for most grades of Crucible Steel. Write for data sheets on the grades you are interested in, or ask your Crucible representative for them.

V. ELIA

GENERAL INDEX

Please Refer to Section Index on Each Divider for Complete Listing of Grades

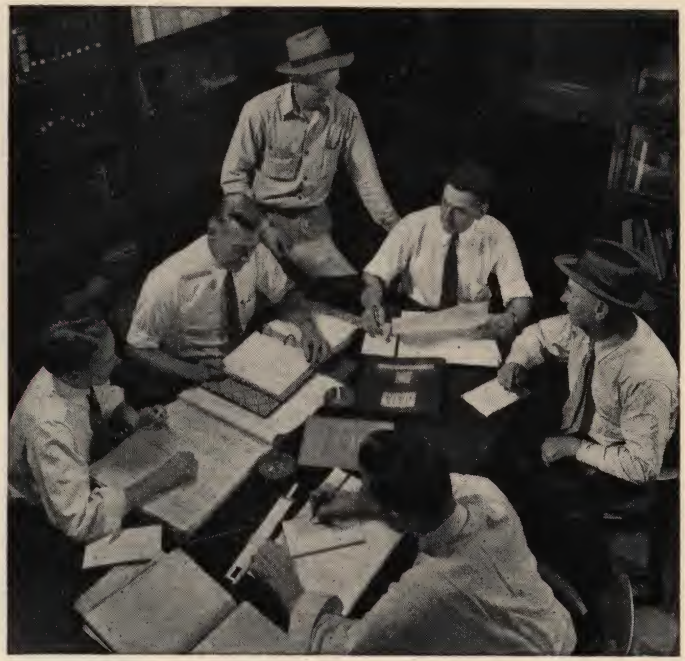


You Can Rely On Crucible's Prompt Service

Crucible's 28 branch-warehouses give you prompt service on the quality steels you need for profitable production. Every grade in every shape and size ordinarily needed is on hand or quickly obtainable for your routine, special or rush requirements. Keep your inventory down . . . let your Crucible Branch-Warehouse be your stockroom. We cut to exact length . . . fill your orders promptly . . . rush your Crucible Steel to you fast!

USE CRUCIBLE ADVISORY SERVICE

Every Crucible Branch-Warehouse offers you the services of trained, experienced, practical men to cooperate with you in the selection and application of the best steels for each production purpose. Supplementing these men in the field is our staff of highly trained service engineers and metallurgists located at our various mills who are thoroughly competent to



Experienced, Capable Crucible Engineers Can Help You

render the finest service available in the application, handling and heat treating of quality steels. Use this Crucible Advisory Service to assure yourself of maximum quality and quantity of output at minimum cost.

FIVE SPECIALTY STEEL MILLS

Crucible Branch-Warehouse Steels are produced in five specialty steel mills where expert craftsmen, modern furnaces, competent supervision and exacting laboratory tests result in clean, dependable, uniform, high-quality steels that meet the most rigid specifications. These are the same high quality steels supplied regularly to thousands of users on mill orders. All of Crucible's Specialty Mills carry extensive mill stocks to supplement Crucible's nationwide branch-warehouse distribution system.

SPAULDING CAST PRODUCTS

Index

SPAULDING CAST PRODUCTS

Index

REXALLOY CAST CUTTING TOOLS

Rexalloy is a cast non-ferrous cutting alloy, ranging in hardness from Rockwell C 60 to 62, which is designed for "Middle-Range" machining applications between high speed steels and tungsten carbides. Consistently uniform, its outstanding characteristics are:

Exceptionally high red hardness as evidenced by the fact that Rexalloy has a high temperature converted Brinell hardness at 425 as compared with 155 for Rex AA high speed steel at the same temperature.

Superior toughness and shock resistance as compared with any other cast non-ferrous cutting tool available, obtained through controlled melting and casting practice.

Resistance to abrasive wear surpassing that of any grade of high speed steel and equal to or better than that of any other cast non-ferrous cutting metal.

WHY YOU SHOULD USE REXALLOY

Rexalloy's high red hardness and other qualities afford definite advantages:

Increased speed, feed and depth of cut are assured for many machining applications presently tooled with high speed steel. Actual shop practice has shown Rexalloy tools to be most efficient when used at cutting speeds ranging from 25% to 80% over the maximum speed for high speed steel tools.

Intermittent cutting, machining of chilled castings and use on semi-rigid machine tool equipment are made possible by Rexalloy's inherent toughness.

Increased tool life between grinds, saving of valuable machine and operator time and improved finish are enabled through Rexalloy's resistance to abrasion. Rexalloy tools will not "crater" as readily as high speed steel tools.

WHERE TO USE REXALLOY

Use Rexalloy on any modern machine tool . . . lathe, milling machine, boring mill, planer, automatic screw machine, and the like . . . that has sufficient reserve power to withstand the greater tool load of increased cutting speed, feed or depth of cut. Rexalloy can be used on older machine tool equipment provided there is not too much chatter and looseness. Use Rexalloy for any machining operation on all types of steel, iron, copper,

brass, bronze, aluminum, and other similar metals with the exception of the milling of steel.

Use Rexalloy where high speed steels have been giving too short a cutting life between grinds, particularly on hard materials, and where tungsten carbide tools are not producing the required results.

REXALLOY NON-CUTTING APPLICATIONS

Use Rexalloy for gauges, straightener guides, centerless grinder rests, wear strips, extrusion die inserts, seal rings, homogenizer valve stems and seats, jet nozzles, balls and seats for oil well barrel pumps and other parts that must resist abrasive or corrosive wear at high or low temperatures.

Submit inquiries for Rexalloy non-cutting applications through your local Crucible branch office.

REXALLOY TOOL BITS

Carbon 2.25% **Chromium 33.00%**
Tungsten 17.00% **Cobalt 44.00%**

Rexalloy Tool Bits give excellent performance on modern production equipment for turning, facing and boring at high cutting speeds. They are, in fact, general purpose tools for "Middle-Range" machining applications that each organization should maintain in stock for regular and special metal-cutting work.

REXALLOY SOLID-SQUARE TOOL BITS

3/16 Square x 2 1/8 Long	1/2 Square x 2 1/2 Long	3/4 Square x 4 Long
x 2 1/2 "	x 3 "	x 4 1/2 "
1/4 Square x 2 1/8 Long	x 3 1/2 "	x 5 "
x 2 1/2 "	x 4 "	x 6 "
5/16 Square x 2 1/2 Long	x 4 1/2 "	7/8 Square x 6 Long
x 3 "	x 5 "	1 Square x 4 Long
3/8 Square x 3 Long	x 6 "	x 5 "
x 4 "	5/8 Square x 3 Long	x 6 "
7/16 Square x 2 1/2 Long	x 3 1/2 "	x 7 "
x 3 "	x 4 "	
x 3 1/2 "	x 4 1/2 "	
	x 5 "	
	x 6 "	

REXALLOY SOLID-RECTANGULAR TOOL BITS

3/16 x 3/8 x 3 Long	3/8 x 1/2 x 4 Long	1/2 x 3/4 x 6 Long
x 3/4 x 3 "	x 1/2 x 5 "	x 1 x 2 "
x 1 x 6 "	x 5/8 x 3 "	x 1 x 4 "
	x 5/8 x 4 "	x 1 x 6 "
1/4 x 5/16 x 2 Long	x 5/8 x 5 "	
x 1/2 x 3 "	x 3/4 x 4 "	5/8 x 3/4 x 5 1/2 Long
x 1/2 x 4 "	x 3/4 x 5 "	x 3/4 x 6 "
x 3/4 x 5 "	x 1 x 4 "	x 1 x 6 "
x 1 x 6 "	x 1 x 6 "	x 1 1/4 x 6 "
5/16 x 1/2 x 4 Long	1/2 x 5/8 x 4 Long	3/4 x 1 x 4 Long
x 5/8 x 5 "	x 3/4 x 3 "	x 1 x 6 "
x 1 x 4 "	x 3/4 x 4 "	x 1 1/4 x 5 "
	x 3/4 x 5 "	x 1 1/4 x 6 "

REXALLOY SOLID-ROUND TOOL BITS

1/4 Diameter x 3 Long	5/8 Diameter x 3 Long
5/16 " x 3 "	3/4 " x 3 "
3/8 " x 3 "	7/8 " x 3 "
1/2 " x 3 "	1 " x 3 "

REXALLOY GROUND SOLID CYLINDERS

3/8 Diameter x 1 1/2 Long	1/2 Diameter x 1 1/2 Long

REXALLOY GROUND INSERTS

3/8 Square x 1 1/2 Long	1/2 Square x 1 1/2 Long	3/4 Square x 1 1/2 Long

REXALLOY TIPPED TOOLS—*Continued*

SHORT TIPS

(Same design as XB group)

Tool No.	*Shank Size*			*Tip Size*		
	A	*B*	*C*	*D*	*W*	*L*
Squares						
X-C1	1/2	1/2	4	5/32	1/2	1
X-C2	5/8	5/8	4 1/2	3/16	5/8	1 1/4
X-C3	3/4	3/4	5	1/4	3/4	1 1/4
X-C3 1/2	7/8	7/8	6	5/16	7/8	1 1/2
X-C4	1	1	8	5/16	1	1 3/4
X-C5	1 1/4	1 1/4	8	3/8	1 1/4	1 3/4
X-C6	1 1/2	1 1/2	10	7/16	1 1/2	2
X-C7	2	2	12	5/8	2	2 1/2
Rectangles						
X-C8	1/2	1	7	5/16	1/2	1 3/4
X-C9	5/8	1 1/4	8	3/8	5/8	2
X-C10	3/4	1	7	3/8	3/4	1 3/4
X-C11	3/4	1 1/2	9	7/16	3/4	2
X-C12	1	1 1/4	8	3/8	1	1 3/4
X-C13	1	1 1/2	10	7/16	1	2
X-C14	1	2	12	5/8	1	2
X-C15	1 1/2	2	12	5/8	1 1/2	2 1/2
X-C16	2	2 1/2	14	3/4	2	2 1/2

Unless otherwise specified, permissible tolerances for dimensions up to and including 1¼ inch ±.010 inch; over 1¼ inch ±.015 inch.

REXALLOY TIPPED CUT-OFF BLADES

Tool No.	*Shank Size*			*Tip Size*		
	A	*B*	*C*	*D*	*W*	*L*
X-P & X-M1	1/8	3/4	6	3/16	1/8	2
X-P & X-M2	3/16	3/4	6	3/16	3/16	2
X-P & X-M3	1/8	7/8	6	3/16	1/8	2
X-P & X-M4	3/16	7/8	6	3/16	3/16	2
X-P & X-M5	1/8	1	6	1/4	1/8	2
X-P & X-M6	3/16	1	7	1/4	3/16	2
X-P & X-M7	1/4	1	7	1/4	1/4	2
X-P & X-M8	1/4	1 1/4	8	1/4	1/4	2
X-P & X-M9	1/4	1 1/2	8	5/16	1/4	2 1/2
X-P & X-M10	3/8	1 1/2	8	5/16	3/8	2 1/2

Unless otherwise specified, permissible tolerances for dimensions up to and including 1¼ inch ±.010 inch; over 1¼ inch ±.015 inch.

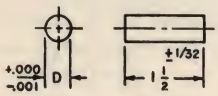
REXALLOY TIPPED TOOLS—*Continued*

SOLID REXALLOY CUT-OFF BLADES

A	*B*	*C*	*D*
Thickness	*Height*	*Length*	*Side Clearance Angle*
1/8	3/4	5	1 1/2
1/8	7/8	5	1 1/2
3/16	1	5 1/2	1 3/4
1/4	1 1/4	6	1 3/4

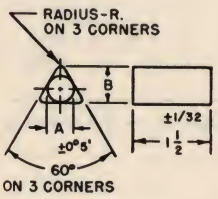
Rexalloy cast alloy cutting tools are interchangeable in the holders for those inserts shown in the General Motors Standards pages C-7, C-7A and C-7B. Those sizes available from stock are shown below.

SOLID REXALLOY CYLINDERS FOR BORING & TURNING



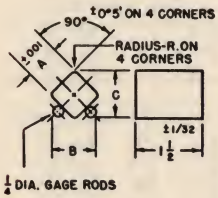
Designation	*Size*
RX-1212-G	3/8 Diameter x 1 1/2
RX-1612-G	1/2 " x 1 1/2

SOLID REXALLOY TRIANGULAR INSERTS



Designation	*Diameter of Inscribed Circle*	*Height*	*Standard Corner Radius*
	A	*B*	*R*
RX-8122-G	1/4	.344	1/32
RX-12123-G	3/8	.516	3/64
RX-16124-G	1/2	.688	1/16

SOLID REXALLOY SQUARE INSERTS



Designation	*Nominal Size*	*Measurement*		*Standard Corner Radius*
	A	*B*	*C*	*R*
RQ-12122-G	3/8	.692	.598	1/32
RQ-16123-G	1/2	.780	.724	3/64
RQ-24124-G	3/4	.957	.983	1/16

REXALLOY FINISH GROUND BALLS*

5/8 Diameter	1 1/8 Diameter	1 11/16 Diameter
3/4 "	1 1/4 "	2 "
15/16 "	1 3/8 "	2 1/2 "
1 "	1 1/2 "	

*Stocked at Spaulding Works, Harrison, N. J.

ACCUMET PRECISION INVESTMENT CASTINGS

Made by the "lost wax" process using wax or plastic injected patterns, these castings are made to extremely close tolerances with exceptionally smooth, satiny surface finish. The two principal advantages of these castings over conventional methods of forming steel are:

1. Intricate shapes with fine detail in machinable grades can be cast to eliminate expensive machining operations and costly tooling.
2. Intricate shapes and fairly simple shapes can be cast in high alloy grades that are difficult or impossible to machine or forge.

SIZE:

From 0.001 lb. to about 3.0 lb. are the usual weight limitations but the large majority of successful applications are under 0.25 lbs. Dimensional limitations are about 10 inches long by 5 inches wide but these are extremes—this process is at its best in small parts a few inches or under with relatively thin sections under ¼ inch.

GRADES:

MACHINERY:

AISI 1010, 1020, 1045, 4140, 4620, 8620.

TOOL STEEL:

Ketos, Airkool, Airdi 150, HYCC.

STAINLESS:

302, 303, 304, 316, 347, 410, 416, 420, 431, 440C, 440F.

SPECIAL:

Alnico, Rexalloy, Rexalloy 33, Rexalloy 51, Rezistal VT, X-40.
A.M.S. 5350, 5360, 5362, 5366, 5382, 5385, 5388.

TYPICAL APPLICATIONS:

Aircraft Structural Parts.

Aircraft Accessory Parts—Carburetors, Fuel Injectors, Regulators, Gyroscopes, Gyro Indicators.

Aircraft Jet Engine Blades & Vanes.

Can Machinery—Grippers, Chain Links, Splash Shields.

Glass Shear Blades.

Machinery Wear Parts.

Magnets—Compass Needles, Head Sets, Hearing Aids, Flow Meter Switches, Toy Trains.

Milk Capping Machines.

Picture Engraving Styli.

Pneumatic Tools.

Radar Equipment.

Textile Machine Parts.

Valves and Valve Seats for Homogenizers, Spray Equipment.

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CRUCAST STEEL CASTINGS—*Continued*

TYPICAL APPLICATIONS:—Continued

Stainless & Heat Resistant Steels

Aircraft Parts.
Burner Parts.
Compressor & Combustion Engine Valves & Valve Seats.
Die Casting Machine Nozzles.
Food Machinery Parts.
Furnace Links, Rollers, Pins, etc.
Glass Molds.
Machinery Parts — Chain Links, Pulleys, Rollers, Fittings, Flanges, etc.
Pipe Fittings.
Skimmers, Hooks, Rabbles.

SPECIAL CLOSE TOLERANCE CASTINGS:

Castings up to about 15 pounds made by the Shell Mold process are available. These castings have very smooth surface finish and tolerances of the order of ±.010 inch or better can be held at moderate cost.

TOOL STEELS

General Index

TOOL STEELS

General Index

TOOL STEELS

General Index

SEND FOR YOUR FREE COPY NOW!

You'll want your CRUCIBLE TOOL STEEL SELECTOR. It uses the only logical method of tool steel selection—begin with the application to pick the right steel! And the answer you get with one turn of the Selector dial will prove satisfactory in every case, for the Crucible Tool Steel Selector covers 22 tool steels which fit 98% of all Tool Steel applications. All the tool steels on the Selector are in Warehouse Stock . . . that means when you get the answer, you can get the steel . . . fast!

Write for your Selector today! We want you to have it, because we know you've never seen anything that approaches your tool steel problems so simply and logically.

Here's how it works:

To use the Selector, all you need know is the characteristics that come with the job: type and condition of material to be worked, the number of pieces to be produced, the method of working, and the condition of the equipment to be used.

FOUR STEPS—and you've got the right answer!

1. Move arrow to major class covering application
2. Select sub-group which best fits application
3. Note major tool characteristics (under arrow) and other characteristics in cut-outs for each grade in sub-group
4. Select tool steel indicated

That's all there is to it!

Here's an example:

Application—Deep drawing die for steel

Major Class—Metal Forming—Cold

Sub-Group—Special Purpose

Tool Characteristics—Wear Resistance

Tool Steel—Airdi 150

One turn of the dial does it!

And you're sure you're right !!

SUGGESTIONS FOR ORDERING TOOL STEEL

Quantity—State the quantity required in pounds, or in feet, or in number of pieces, and state whether exact or random lengths are desired.

Size—State carefully the section or shape, such as round, square, flat, octagon, special, and whether a round cornered or square cornered edge is desired on square or flat sizes. Give accurately the dimensions, such as diameter and width and thickness on flat sections. In ordering octagons give the size as the distance between parallel flat surfaces. Special shapes should be sketched and dimensioned accurately. Specify any special tolerances on dimensions which may be required. All dimensions are assumed to be rough dimensions. If finished sizes, please so state.

Condition and Finish—Specify whether the material is desired as—

Hot rolled	**Cold rolled**
Hammered	**Cold drawn**
Rough turned	**Centerless ground**

State whether the material is desired in the—

Natural condition **Annealed condition** **Heat treated condition**

If heat treated material is desired, state the approximate hardness desired in the heat treated steel. If definite hardness limits are required, it must be so stated.

ALLOWANCES FOR MACHINING—Tool Steels require a uniformly hard surface for their successful use. It is therefore necessary to remove all decarburization and other surface imperfections before heat treating. The following tables list the minimum allowances for machining CRUCIBLE TOOL STEELS to assure freedom from undesirable surface conditions. It is important that these allowances be applied to the NOMINAL size of the bar, rod or forging.

MINIMUM ALLOWANCES FOR MACHINING

ROUNDS, HEXAGONS AND OCTAGONS

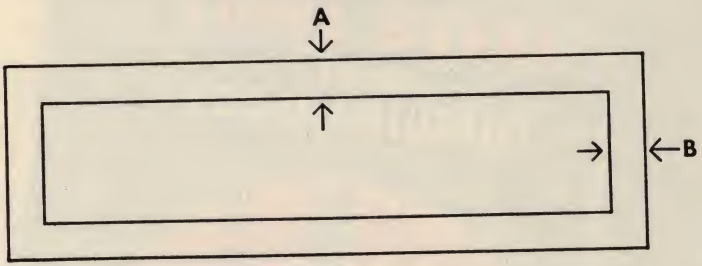
Minimum Allowance Per Side for Machining Prior to Heat Treatment, Inch

Nominal Size, Inches	*Hot Rolled*	*Hammered*	*Rough Turned*	*Cold Drawn*
Up to ½ Incl.	.015	—	—	.015
Over ½ to 1 Incl.	.025	—	—	.025
Over 1 to 2 Incl.	.040	—	—	.040
Over 2 to 3 Incl.	.055	.100	.025	.055
Over 3 to 4 Incl.	.070	.125	.030	—
Over 4 to 5 Incl.	.095	.125	.040	—
Over 5 to 6 Incl.	—	—	.050	—
Over 6	—	—	.060	—

MINIMUM ALLOWANCES FOR MACHINING

HOT ROLLED SQUARE AND FLAT BARS

Minimum Allowance Per Side for Machining Prior to Heat Treatment, Inch



NOMINAL WIDTH, INCHES

Nominal Thickness, Inches		*0 to ½*	*Over ½ to 1 Incl.*	*Over 1 to 2 Incl.*	*Over 2 to 3 Incl.*	*Over 3 to 4 Incl.*	*Over 4 to 6 Incl.*	*Over 6*
0 to ½ Incl.	A	.020	.020	.025	.025	.030	.035	.040
	B	.020	.030	.045	.060	.080	.100	.125
Over ½ to 1 Incl.	A	—	.030	.030	.030	.035	.040	.050
	B	—	.030	.045	.060	.080	.100	.125
Over 1 to 2 Incl.	A	—	—	.045	.045	.050	.055	.060
	B	—	—	.045	.060	.080	.100	.125
Over 2 to 3 Incl.	A	—	—	—	.060	.060	.065	.070
	B	—	—	—	.060	.085	.100	.125
Over 3 to 4 Incl.	A	—	—	—	—	.080	.080	—
	B	—	—	—	—	.080	.100	—
Over 4	A*	—	—	—	—	—	—	—
	B*	—	—	—	—	—	—	—

*Tool steel bars greater than 4 inches thick are usually hammered.

MINIMUM ALLOWANCES FOR MACHINING

HAMMERED SQUARE AND FLAT BARS

Minimum Allowance Per Side for Machining Prior to Heat Treatment, Inch

Nominal Thickness, Inches		NOMINAL WIDTH, INCHES			
	Under 2	*Over 2 to 3 Inclusive*	*Over 3 to 6 Inclusive*	*Over 6 to 12 Inclusive*	*Over 12*
Under 2.....	A *	—	—	—	—
	B *	—	—	—	—
Over 2 to 3 Incl....	A	.100	.100	.125	.125
	B	.100	.125	.125	.187
3 to 6 Incl.....	A	—	.125	.125	.125
	B	—	.125	.125	.187
Over 6.....	A #	—	—	—	—
	B #	—	—	—	—

*Tool steel bars under 2 inches are usually rolled.
#Machining allowances for hammered tool steel bars greater than 6 inches thick must be determined on the basis of the individual item.

No allowances for machining need be made on centerless ground material prior to heat treatment. However, consideration must be given to the normal size tolerances to which centerless ground material is supplied.

Shipping Instructions—Give full and complete shipping instructions, including any special routing instructions—whether freight, express, parcel post, ship, etc., and details as to the packing or boxing desired.

Warranty—We will replace defective steel and steel in first hands found unsuitable for the proper usage when the purpose for which the steel is to be used is stated on the order. We cannot assume consumers' own shop risks, such as damage in labor put upon the steel.

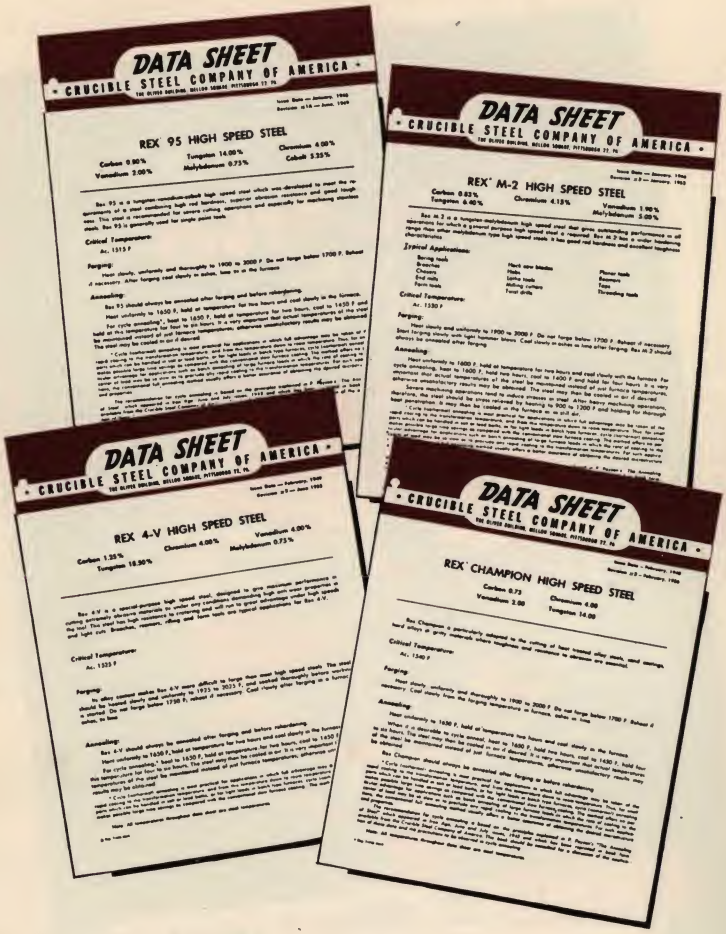
Purpose—State clearly on every order the purpose for which the steel is to be used. This may allow us to prevent a misapplication and to recommend other steels which may be more suitable for the purpose than that ordered and at the same time to put the steel shipped in the best condition for the particular application for which it is intended.

TOOL STEEL FOR THE NON-METALLURGIST

A tool is usually worth no more than its weight in scrap until it has been heat treated. It is, therefore, important that proper heat treating techniques be employed to achieve maximum service from your tools. Crucible's "Tool Steel For The Non-Metallurgist" is an excellent guide for the selection and proper heat treatment of tool steels.

FREE UPON REQUEST

CRUCIBLE DATA SHEETS



A Crucible Data Sheet is available for each grade of tool steel. They contain specific and detailed data pertaining to each grade including a TTT curve, working and heat treating recommendations.

FREE UPON REQUEST

HIGH SPEED STEELS

Index

HIGH SPEED STEELS

Index

REX HIGH SPEED STEELS

Wherever high speed steels are used Crucible's Rex High Speed Steels are the standard by which all others are judged. It is a fact that large manufacturers of tools made of high speed steel depend upon Rex to maintain the reputation of their product. The ability of Rex to meet the exacting requirements and rigid inspection of the tool manufacturer is a definite assurance to the purchaser of high speed steel, that only the highest in quality leaves the mill under the Rex label.

REX M-2 HIGH SPEED STEEL

Rex M-2 is Crucible's tungsten-molybdenum high speed steel that gives outstanding performance in all operations for which a general purpose high speed steel is required. This steel has good red hardness and excellent toughness characteristics. Rex M-2 has a wider hardening range than other molybdenum type high speed steels.

●

OUTSTANDING ADVANTAGES

1. **An improved tungsten-molybdenum high speed steel for general purpose use.**
2. **Costs less per pound, per bar, and per operation than 18-4-1 high speed steel.**
3. **Yields 7.5% more tools per pound than 18-4-1 high speed steel.**
4. **Permits standardization on a single efficient tungsten-molybdenum high speed steel for general purpose use.**
5. **The type chosen by the three largest motor car manufacturers for general purpose use.**
6. **Now in stock at Crucible Warehouses in a wide range of shapes and sizes.**

●

Standardize on Rex M-2 for outstanding cutting efficiency on all general purpose work!

REX M-2 HIGH SPEED STEEL BARS

Carbon 0.83% **Tungsten 6.40%** **Chromium 4.15%**
Vanadium 1.90% **Molybdenum 5.00%**

Annealed

Rex M-2 is a tungsten-molybdenum high speed steel that gives outstanding performance in all operations for which a general purpose high speed steel is required. Rex M-2 has a wider hardening range than other molybdenum type high speed steels. It has good red hardness and excellent toughness characteristics.

ROUNDS

1/4	1 5/16	2 3/8	3 1/2	5 1/8
5/16	1 3/8	2 7/16	3 5/8	5 1/4
3/8	1 7/16	2 1/2	3 3/4	5 11/32
7/16	1 1/2	2 9/16	3 7/8	5 3/8
1/2	1 9/16	2 5/8	4	5 1/2
9/16	1 5/8	2 11/16	4 1/16	5 19/32
5/8	1 11/16	2 3/4	4 1/8	5 5/8
11/16	1 3/4	2 13/16	4 1/4	5 3/4
3/4	1 13/16	2 7/8	4 11/32	6
13/16	1 7/8	2 15/16	4 3/8	6 1/8
7/8	1 15/16	3	4 1/2	6 1/4
15/16	2	3 1/16	4 19/32	6 3/8
1	2 1/16	3 1/8	4 5/8	6 1/2
1 1/16	2 1/8	3 3/16	4 3/4	6 5/8
1 1/8	2 3/16	3 1/4	4 7/8	8 1/8
1 3/16	2 1/4	3 3/8	5	10 1/8
1 1/4	2 5/16			

FLATS

1/2 x 1/8	7/8 x 3/16	3/4 x 1/4	2 1/2 x 1/4
5/8 x 1/8	1 x 3/16	7/8 x 1/4	3 x 1/4
3/4 x 1/8	1 1/4 x 3/16	1 x 1/4	3/8 x 5/16
7/8 x 1/8	1 1/2 x 3/16	1 1/16 x 1/4	5/8 x 5/16
1 x 1/8	1 3/4 x 3/16	1 1/8 x 1/4	11/16 x 5/16
1 1/4 x 1/8	2 x 3/16	1 1/4 x 1/4	13/16 x 5/16
1 1/2 x 1/8	3/8 x 1/4	1 1/2 x 1/4	3/4 x 5/16
1/2 x 3/16	1/2 x 1/4	1 3/4 x 1/4	7/8 x 5/16
5/8 x 3/16	9/16 x 1/4	2 x 1/4	1 x 5/16
3/4 x 3/16	5/8 x 1/4	2 1/4 x 1/4	1 1/16 x 5/16

REX M-2 HIGH SPEED STEEL BARS—*Continued*

FLATS—*Continued*

1 1/8	x 5/16	2 1/2	x 1/2	1 9/16	x 11/16	5 1/2	x 7/8
1 1/4	x 5/16	3	x 1/2	1 3/4	x 11/16	6	x 7/8
1 1/2	x 5/16	3 1/2	x 1/2	1 7/8	x 11/16	1 1/16	x 15/16
1 3/4	x 5/16	3 3/4	x 1/2	2	x 11/16	1 1/8	x 1
2	x 5/16	4	x 1/2	7/8	x 3/4	1 1/4	x 1
1/2	x 3/8	3/4	x 9/16	1	x 3/4	1 3/8	x 1
5/8	x 3/8	13/16	x 9/16	1 1/8	x 3/4	1 1/2	x 1
3/4	x 3/8	15/16	x 9/16	1 1/4	x 3/4	1 5/8	x 1
7/8	x 3/8	1 1/16	x 9/16	1 3/8	x 3/4	1 3/4	x 1
1	x 3/8	1 1/8	x 9/16	1 1/2	x 3/4	1 7/8	x 1
1 1/8	x 3/8	1 1/4	x 9/16	1 5/8	x 3/4	2	x 1
1 1/4	x 3/8	1 5/16	x 9/16	1 3/4	x 3/4	2 1/8	x 1
1 3/8	x 3/8	1 3/8	x 9/16	2	x 3/4	2 1/4	x 1
1 1/2	x 3/8	1 1/2	x 9/16	2 1/4	x 3/4	2 1/2	x 1
1 3/4	x 3/8	1 5/8	x 9/16	2 3/8	x 3/4	2 3/4	x 1
2	x 3/8	1 3/4	x 9/16	2 1/2	x 3/4	3	x 1
2 1/4	x 3/8	2	x 9/16	2 3/4	x 3/4	3 1/2	x 1
2 1/2	x 3/8	4 3/4	x 9/16	3	x 3/4	4	x 1
3	x 3/8	3/4	x 5/8	3 1/2	x 3/4	5	x 1
3 1/2	x 3/8	7/8	x 5/8	4	x 3/4	6	x 1
4	x 3/8	1	x 5/8	4 1/2	x 3/4	12 5/8	x 1
5/8	x 7/16	1 1/8	x 5/8	1 1/16	x 13/16	1 1/8	x 1 1/16
3/4	x 7/16	1 1/4	x 5/8	1 1/8	x 13/16	1 3/16	x 1 1/16
13/16	x 7/16	1 3/8	x 5/8	1 1/4	x 13/16	1 5/16	x 1 1/16
7/8	x 7/16	1 1/2	x 5/8	1 5/16	x 13/16	1 3/8	x 1 1/16
1	x 7/16	1 5/8	x 5/8	1 3/8	x 13/16	1 9/16	x 1 1/16
1 1/8	x 7/16	1 3/4	x 5/8	1 1/2	x 13/16	1 13/16	x 1 1/16
1 1/4	x 7/16	2	x 5/8	1 9/16	x 13/16	2 1/16	x 1 1/16
1 3/8	x 7/16	2 1/4	x 5/8	1 13/16	x 13/16	1 1/4	x 1 1/8
1 1/2	x 7/16	2 1/2	x 5/8	1	x 7/8	1 3/8	x 1 1/8
1 5/8	x 7/16	2 3/4	x 5/8	1 1/8	x 7/8	1 1/2	x 1 1/8
1 3/4	x 7/16	3	x 5/8	1 1/4	x 7/8	1 5/8	x 1 1/8
2	x 7/16	3 1/4	x 5/8	1 3/8	x 7/8	1 3/4	x 1 1/8
5/8	x 1/2	3 1/2	x 5/8	1 1/2	x 7/8	1 7/8	x 1 1/8
3/4	x 1/2	4	x 5/8	1 5/8	x 7/8	2	x 1 1/8
7/8	x 1/2	13/16	x 11/16	1 3/4	x 7/8	2 1/8	x 1 1/8
1	x 1/2	15/16	x 11/16	2	x 7/8	2 1/4	x 1 1/8
1 1/8	x 1/2	1	x 11/16	2 1/8	x 7/8	2 3/8	x 1 1/8
1 1/4	x 1/2	1 1/16	x 11/16	2 1/4	x 7/8	2 1/2	x 1 1/8
1 3/8	x 1/2	1 1/8	x 11/16	2 1/2	x 7/8	2 3/4	x 1 1/8
1 1/2	x 1/2	1 1/4	x 11/16	2 3/4	x 7/8	3	x 1 1/8
1 5/8	x 1/2	1 5/16	x 11/16	3	x 7/8	1 3/8	x 1 1/4
1 3/4	x 1/2	1 3/8	x 11/16	4	x 7/8	1 1/2	x 1 1/4
2	x 1/2	1 7/16	x 11/16	4 1/2	x 7/8	1 5/8	x 1 1/4
2 1/4	x 1/2	1 1/2	x 11/16	5	x 7/8	1 3/4	x 1 1/4

REX M-2 HIGH SPEED STEEL BARS—*Continued*

FLATS—*Continued*

2 x 1¼	1¾ x 1⅜	2½ x 1½	4 x 1¾
2⅛ x 1¼	1⅞ x 1⅜	2¾ x 1½	12⅝ x 1¾
2¼ x 1¼	2 x 1⅜	3 x 1½	2¼ x 2
2⅜ x 1¼	2⅛ x 1⅜	3½ x 1½	2½ x 2
2½ x 1¼	2¼ x 1⅜	4 x 1½	2¾ x 2
3 x 1¼	2⅜ x 1⅜	5 x 1½	3 x 2
3¼ x 1¼	2⅝ x 1⅜	6 x 1½	3½ x 2
3½ x 1¼	2¾ x 1⅜	12⅝ x 1½	4 x 2
4 x 1¼	3⅛ x 1⅜	1¾ x 1⅝	12⅝ x 2
4½ x 1¼	1⁹⁄₁₆ x 1⁷⁄₁₆	1⅞ x 1⅝	3 x 2¼
5 x 1¼	2³⁄₁₆ x 1⁷⁄₁₆	2 x 1⅝	2¾ x 2½
6 x 1¼	1¾ x 1½	2⅛ x 1⅝	3 x 2½
12⅝ x 1¼	1⅞ x 1½	2⅝ x 1⅝	3½ x 2½
1⁹⁄₁₆ x 1⅝	2 x 1½	2 x 1¾	4 x 2½
2¹⁄₁₆ x 1⅝	2⅛ x 1½	2¼ x 1¾	12⅝ x 2½
1½ x 1⅜	2¼ x 1½	2½ x 1¾	4 x 3
1⅝ x 1⅜	2⅜ x 1½	2¾ x 1¾	12⅝ x 3

SQUARES

¼	⁹⁄₁₆	1	1½	2⅛
⁵⁄₁₆	⅝	1¹⁄₁₆	1⅝	2¼
⅜	¾	1⅛	1¾	2½
⁷⁄₁₆	¹³⁄₁₆	1¼	1⅞	3
½	⅞	1⅜	2	4

REX M-2 HIGH SPEED STEEL SHEETS

Annealed

20 x .035/.041 x 72 Long	20 x .165/.175 x 72 Long
20 x .047/.053 x 72 "	20 x .180/.190 x 72 "
20 x .062/.068 x 72 "	20 x .194/.204 x 72 "
20 x .070/.076 x 72 "	20 x .202/.217 x 72 "
20 x .079/.085 x 72 "	20 x .215/.230 x 72 "
20 x .092/.098 x 72 "	20 x .224/.239 x 72 "
20 x .100/.107 x 72 "	20 x .242/.257 x 72 "
20 x .111/.119 x 72 "	20 x .276/.306 x 72 "
20 x .122/.130 x 72 "	20 x .307/.338 x 72 "
20 x .132/.140 x 72 "	20 x .339/.369 x 72 "
20 x .143/.153 x 72 "	20 x .370/.400 x 72 "
20 x .150/.160 x 72 "	20 x .433/.463 x 72 "

REX M-2 HIGH SPEED CENTERLESS GROUND STEEL BARS

12-14 FOOT LENGTHS

Annealed

ROUNDS

1/4	11/32	.440	13/64	11/16	57/64
.260	3/8	.448	17/32	.753	1.005
9/32	.385	1/2	.628	49/64	1 1/64
5/16	25/64	.505	41/64	53/64	1 1/16
.318	7/16	.510	21/32	55/64	

REX M-2 HIGH SPEED ROUGH GROUND STEEL BARS

Annealed

ROUNDS

.538	.630

FLATS

15/32 x 9/32 9/16 x 9/32	41/64 x 13/32 31/32 x 17/32	1 13/32 x 21/32

REX M-2 HIGH SPEED NAIL DIE STEEL BARS

Hot Rolled Annealed

DOUBLE BEVELED

# 8 1 5/8 x 1 1/8 # 10 1 1/2 x 15/16 # 14 1 3/8 x 13/16	# 16 1 1/8 x 11/16 # 19 1 5/16 x 9/16 # 21 15/16 x 11/16	# 23 13/16 x 9/16 # 26 11/16 x 7/16

REX M-2 HIGH SPEED TOOL BITS

Hardened — Ends Beveled

SQUARES

3/16 x 2 1/2 Long	3/8 x 3 Long	5/8 x 4 1/2 Long	7/8 x 6 Long
1/4 x 2 1/2 "	7/16 x 3 1/2 "	3/4 x 5 "	1 x 7 "
5/16 x 2 1/2 "	1/2 x 4 "		

REX M-2 HIGH SPEED STEEL FORGINGS

Annealed

Rex M-2 High Speed Forgings offer cutter manufacturers a tungsten-molybdenum high speed forging of uniform structure, closeness to size and smooth finish.

Diameter	*Thickness*	*Diameter*	*Thickness*	*Diameter*	*Thickness*
1 7/8	1/2	4 1/2	3/4	7	1/2
2 1/4	2	5	3/8	7	5/8
3	1/2	5	5/8	7	3/4
3	1 3/4	5	3/4	7	1
3	3	5	4	7	6
3 1/2	3	5 1/2	1/2	7 1/2	6
4	3/8	5 1/2	5/8	8	3/8
4	1/2	5 1/2	1	8	1/2
4	5/8	6	1/4	8	5/8
4	3/4	6	3/8	8	3/4
4	7/8	6	1/2	8	7/8
4	1	6	5/8	8	1
4	2 1/4	6	3/4	9	1
4	4	6	7/8	10	1/2
4	5	6	1	10	1
4 1/2	1/2				

REX M-2-S HIGH SPEED STEEL BARS

Carbon 0.83% **Chromium 4.15%** **Vanadium 1.90%**

Tungsten 6.40% **Sulphur 0.15%** **Molybdenum 5.00%**

Rex M-2-S is the sulphur-bearing counterpart or modification of the regular Rex M-2 High Speed Steel. It has been designed for use where extensive machining is encountered. Under normal conditions, it will provide an improvement in "machinability" of about 25 to 35%, together with an expected increase in tool life.

In addition to these characteristics, Rex M-2-S embodies all the advantages of the standard Rex M-2 which is a tungsten-molybdenum high speed steel that gives outstanding performance in all operations for which a general purpose high speed steel is required. Rex M-2 has a wider hardening range than other molybdenum type high speed steels. It has good red hardness and excellent toughness characteristics.

Annealed

ROUNDS

1/4	13/16	1 1/2	2 5/8	4	5 1/16
9/32	7/8	1 9/16	2 3/4	4 1/16	5 1/8
5/16	29/32	1 5/8	2 7/8	4 1/8	5 1/4
11/32	15/16	1 11/16	3	4 1/4	5 3/8
3/8	31/32	1 3/4	3 1/16	4 3/8	5 1/2
13/32	1	1 13/16	3 1/8	4 7/16	5 5/8
7/16	1 1/32	1 7/8	3 1/4	4 1/2	5 3/4
1/2	1 1/16	1 15/16	3 3/8	4 5/8	5 7/8
9/16	1 1/8	2	3 7/16	4 11/16	6
19/32	1 3/16	2 1/16	3 1/2	4 3/4	6 1/16
5/8	1 1/4	2 1/8	3 9/16	4 13/16	6 1/8
21/32	1 5/16	2 1/4	3 5/8	4 7/8	6 3/8
3/4	1 3/8	2 3/8	3 3/4	5	6 5/8
23/32	1 7/16	2 1/2	3 7/8		

SQUARES

1/4	11/16	1 1/4	2
5/16	3/4	1 5/16	2 1/2
3/8	7/8	1 3/8	3
7/16	1	1 7/16	4
1/2	1 1/8	1 1/2	
5/8	1 3/16	1 3/4	

REX M-2-S HIGH SPEED STEEL BARS—*Continued*

Annealed

FLATS

1 x 1/4	1 3/4 x 9/16	1 3/16 x 15/16	3 1/4 x 1 3/8
9/16 x 5/16	1 13/16 x 9/16	1 5/16 x 15/16	3 1/2 x 1 3/8
1 3/16 x 5/16	2 1/16 x 9/16	1 7/16 x 15/16	4 1/8 x 1 3/8
1 5/16 x 5/16	7/8 x 5/8	1 9/16 x 15/16	1 5/8 x 1 7/16
1 9/16 x 5/16	1 1/16 x 5/8	1 13/16 x 15/16	2 x 1 7/16
1 3/4 x 5/16	1 1/4 x 5/8	2 1/8 x 15/16	2 1/16 x 1 7/16
3/4 x 3/8	1 1/2 x 5/8	1 1/16 x 1	2 5/16 x 1 7/16
1 5/16 x 3/8	1 3/4 x 5/8	1 1/4 x 1	1 5/8 x 1 1/2
1 3/8 x 3/8	1 7/8 x 5/8	1 5/16 x 1	2 x 1 1/2
1 1/2 x 3/8	3 3/8 x 5/8	1 7/16 x 1	2 1/16 x 1 1/2
1 9/16 x 3/8	1 3/16 x 11/16	1 1/2 x 1	2 5/8 x 1 1/2
1 3/4 x 3/8	1 13/16 x 11/16	1 11/16 x 1	3 x 1 1/2
1 7/8 x 3/8	2 1/16 x 11/16	1 3/4 x 1	3 1/8 x 1 1/2
2 1/8 x 3/8	1 1/16 x 3/4	1 13/16 x 1	1 11/16 x 1 9/16
2 1/4 x 3/8	1 1/4 x 3/4	1 15/16 x 1	1 13/16 x 1 9/16
3 1/4 x 3/8	1 5/16 x 3/4	2 x 1	1 7/8 x 1 9/16
11/16 x 7/16	1 7/16 x 3/4	2 1/16 x 1	2 x 1 9/16
15/16 x 7/16	1 1/2 x 3/4	3 x 1	2 1/16 x 1 9/16
1 1/16 x 7/16	1 9/16 x 3/4	1 7/16 x 1 1/16	2 1/4 x 1 5/8
1 3/16 x 7/16	1 3/4 x 3/4	1 5/8 x 1 1/16	2 1/2 x 1 5/8
1 5/16 x 7/16	1 7/8 x 3/4	1 3/4 x 1 1/16	2 3/4 x 1 5/8
1 7/16 x 7/16	2 x 3/4	2 3/16 x 1 1/16	3 x 1 5/8
1 9/16 x 7/16	15/16 x 13/16	2 5/16 x 1 1/16	3 1/8 x 1 5/8
1 3/4 x 7/16	1 x 13/16	1 5/16 x 1 3/16	3 5/8 x 1 5/8
2 1/8 x 7/16	1 3/16 x 13/16	1 7/16 x 1 3/16	1 3/4 x 1 11/16
2 9/16 x 7/16	1 5/8 x 13/16	1 9/16 x 1 3/16	2 7/16 x 1 11/16
3 1/2 x 7/16	1 3/4 x 13/16	1 11/16 x 1 3/16	1 7/8 x 1 3/4
1 x 1/2	2 x 13/16	1 13/16 x 1 3/16	2 1/8 x 1 3/4
1 9/16 x 1/2	2 1/8 x 13/16	1 15/16 x 1 3/16	2 1/4 x 1 3/4
1 3/4 x 1/2	1 1/16 x 7/8	2 x 1 1/4	3 x 1 3/4
2 x 1/2	1 3/16 x 7/8	1 7/16 x 1 5/16	2 1/8 x 1 7/8
3 1/4 x 1/2	1 5/16 x 7/8	1 11/16 x 1 5/16	2 3/8 x 1 7/8
11/16 x 9/16	1 7/16 x 7/8	1 13/16 x 1 5/16	3 1/2 x 1 7/8
7/8 x 9/16	1 9/16 x 7/8	1 15/16 x 1 5/16	2 1/8 x 2
1 x 9/16	1 11/16 x 7/8	2 3/16 x 1 5/16	2 1/2 x 2
1 3/16 x 9/16	1 7/8 x 7/8	2 5/16 x 1 5/16	2 3/8 x 2 1/8
1 7/16 x 9/16	2 1/16 x 7/8	2 1/2 x 1 3/8	2 5/8 x 2 1/8
1 9/16 x 9/16	1 x 15/16	2 5/8 x 1 3/8	

REX M-2-S HIGH SPEED CENTERLESS GROUND STEEL BARS

Annealed

ROUNDS

.503	1.003

REX M-2-S FORGINGS

Diameter	*Thickness*	*Diameter*	*Thickness*	*Diameter*	*Thickness*
3	1¾	5	1	7¼	1
3½	1⅞	5½	⅜	7½	1¼
4	⅜	5½	¾	8	½
4	½	6	½	8	¾
4	¾	6	1	8	1
4	1⅛	6½	½	9	1 1/16
4½	⅝	6½	⅝	10	½
4½	½	6½	¾	10	1
5	½	7	¾	12	½
5	¾	7	1		

REX M-2-5 HIGH SPEED STEEL BARS

Carbon 0.83% **Chromium 4.15%** **Vanadium 1.90%**
Tungsten 6.40% **Molybdenum 5.00%** **Cobalt 5.00%**

Rex M-2-5 is a molybdenum-tungsten-cobalt high speed steel. The addition of cobalt to the molybdenum-tungsten base of Rex M-2 produces a steel which is suited for applications requiring higher red hardness and abrasion resistance than is obtainable with Rex M-2.

Annealed

SQUARES

⅝	1	1¼
¾	1 1/16	1⅜
⅞	1⅛	1½

HOT ROLLED FLATS

3½ x 1½	3½ x 2	4½ x 2

REX M-2-5 BITS

Hardened and Unground

SQUARES

5/16 x 2 1/2 Long	1/2 x 4 Long	3/4 x 5 Long
3/8 x 3 "	5/8 x 4 1/2 "	1 x 7 "

REX M-3 HIGH SPEED STEEL

Carbon 1.05% **Chromium 4.00%** **Vanadium 2.50%**
Tungsten 5.75% **Molybdenum 5.00%**

Rex M-3 is a special high speed steel that gives exceptional performance under conditions demanding high resistance to abrasion coupled with good impact strength. Broaches, form tools, lathe tools, reamers and cut-off tools are typical applications for Rex M-3.

Annealed

SQUARES

9/16	3/4	15/16	1 1/8	1 1/2
11/16	13/16	1 1/16	1 1/4	2

ROUNDS

1/2	13/16	1 3/16	1 1/2	2 1/8
5/8	7/8	1 1/4	1 5/8	2 3/8
11/16	1	1 5/16	1 3/4	3 1/8
3/4	1 1/8	1 3/8	2	

REX M-3 HIGH SPEED STEEL BARS

Annealed

FLATS

3/4 x 1/4	3/4 x 1/2	1 1/16 x 9/16	7/8 x 11/16
3/4 x 3/8	1 x 1/2	1 3/16 x 9/16	1 x 11/16
1 x 3/8	1 1/8 x 1/2	2 x 9/16	1 1/16 x 11/16
1 x 7/16	1 3/16 x 1/2	1 1/4 x 5/8	1 1/8 x 11/16
1 1/16 x 7/16	13/16 x 9/16	1 1/2 x 5/8	1 5/16 x 11/16

REX M-3 HIGH SPEED STEEL BARS—*Continued*

Annealed

FLATS—*Continued*

1 9/16 x 1 1/16	1 3/16 x 13/16	1 15/16 x 15/16	1 1/4 x 1 1/8
2 x 1 1/16	1 5/8 x 13/16	1 1/16 x 1	1 1/2 x 1 1/4
13/16 x 3/4	2 1/16 x 13/16	1 1/8 x 1	2 x 1 1/4
1 1/8 x 3/4	1 x 7/8	1 1/4 x 1	3 1/2 x 1 1/4
1 1/2 x 3/4	1 1/8 x 7/8	1 1/2 x 1	1 7/16 x 1 5/16
1 5/8 x 3/4	1 1/4 x 7/8	1 5/8 x 1	1 9/16 x 1 5/16
1 3/4 x 3/4	1 3/8 x 7/8	1 3/4 x 1	1 5/8 x 1 3/8
1 7/8 x 3/4	1 1/2 x 7/8	2 x 1	2 x 1 1/2
2 x 3/4	1 3/4 x 7/8	1 1/8 x 1 1/16	2 1/2 x 1 1/2
2 1/8 x 3/4	2 1/8 x 7/8	1 1/4 x 1 1/16	3 x 2
1 1/16 x 13/16	1 1/16 x 15/16	1 5/16 x 1 1/16	

REX M-3 BITS

Hardened and Ground

SQUARES

1/4 x 2 1/2 Long	5/16 x 2 1/2 Long	3/8 x 3 Long	1/2 x 4 Long

REX M-3-S HIGH SPEED STEEL

Carbon 1.05% **Chromium 4.00%** **Vanadium 3.00%**
Tungsten 5.75% **Sulphur 0.15%** **Molybdenum 5.00%**

Rex M-3-S is the sulphur-bearing counterpart or modification of the regular Rex M-3 High Speed Steel. It has been designed for use where extensive machining is encountered. Under normal conditions, it will provide an improvement in "machinability" of about 25 to 35%, together with an expected increase in tool life.

In addition to these characteristics, Rex M-3-S embodies all the advantages of the standard Rex M-3, which is a special high speed steel that gives exceptional performance under conditions demanding high resistance to abrasion coupled with good impact strength. Broaches, form tools, lathe tools, reamers and cut-off tools are typical applications for Rex M-3-S.

REX M-3-S HIGH SPEED TOOL BITS

Hardened—Unground—Beveled Ends

SQUARES

3/8 x 3 Long	1/2 x 4 Long	3/4 x 5 Long
7/16 x 3 1/2 "	5/8 x 4 1/2 "	

REX AA HIGH SPEED STEEL BARS

Carbon 0.73% Tungsten 18.00% Chromium 4.00% Vanadium 1.15%

Annealed

NX Temper (0.71% to 0.75%C) unless otherwise specified

Rex AA is the original 18-4-1 high speed steel, having been first introduced in 1904. Melting practice and processing have been improved since that time, but nevertheless it is so properly balanced and the fundamental characteristics so sound, that today it is still the standard, general purpose high speed steel. Rex AA has a wide hardening range. This steel is less susceptible to soft skin during hardening than other types and has good red hardness and toughness values.

ROUNDS

1/4	*1 1/4	2 3/8	3 7/8
5/16	*1 5/16	*2 1/2	4
3/8	*1 3/8	*2 5/8	4 1/16
7/16	*1 7/16	2 3/4	4 1/8
* 1/2	*1 1/2	2 13/16	4 3/16
9/16	1 9/16	2 7/8	4 1/4
* 5/8	*1 5/8	*3	4 1/2
11/16	*1 11/16	3 1/16	4 5/8
* 3/4	*1 3/4	*3 1/8	4 3/4
* 13/16	*1 7/8	3 1/4	5
* 7/8	1 15/16	3 3/8	5 1/8
15/16	*2	3 1/2	5 1/4
*1	2 1/8	3 5/8	5 1/2
1 1/16	*2 3/16	3 11/16	6
*1 1/8	2 1/4	*3 3/4	6 5/8
*1 3/16			

* These sizes available in OX Temper, 0.63%C.

REX AA HIGH SPEED STEEL BARS — *Continued*

FLATS

1/4 x 1/8	2 x 3/8	2 x 3/4	2 x 1 1/4
1/2 x 1/8	2 1/4 x 3/8	2 1/4 x 3/4	2 1/4 x 1 1/4
3/4 x 1/8	2 1/2 x 3/8	2 1/2 x 3/4	2 1/2 x 1 1/4
1 x 1/8	3 x 3/8	3 x 3/4	3 x 1 1/4
1 1/4 x 1/8	5/8 x 1/2	4 x 3/4	3 1/2 x 1 1/4
3/8 x 3/16	3/4 x 1/2	6 x 3/4	4 x 1 1/4
1/2 x 3/16	7/8 x 1/2	1 x 7/8	5 x 1 1/4
3/4 x 3/16	1 x 1/2	1 1/8 x 7/8	6 x 1 1/4
1 x 3/16	1 1/8 x 1/2	1 1/4 x 7/8	1 3/4 x 1 1/2
1 1/4 x 3/16	1 1/4 x 1/2	1 1/2 x 7/8	2 x 1 1/2
1 1/2 x 3/16	1 1/2 x 1/2	1 5/8 x 7/8	2 1/2 x 1 1/2
1/2 x 1/4	1 3/4 x 1/2	1 3/4 x 7/8	2 3/4 x 1 1/2
3/4 x 1/4	2 x 1/2	2 x 7/8	3 x 1 1/2
7/8 x 1/4	2 1/4 x 1/2	2 1/4 x 7/8	3 1/2 x 1 1/2
1 x 1/4	2 1/2 x 1/2	2 1/2 x 7/8	4 x 1 1/2
1 1/4 x 1/4	3 x 1/2	1 1/4 x 1	5 x 1 1/2
1 1/2 x 1/4	4 x 1/2	1 3/8 x 1	6 x 1 1/2
2 x 1/4	4 1/2 x 17/32	1 1/2 x 1	10 x 1 1/2
2 1/2 x 1/4	6 x 17/32	1 3/4 x 1	2 x 1 3/4
1/2 x 5/16	1 x 9/16	1 7/8 x 1	2 1/4 x 1 3/4
3/4 x 5/16	3/4 x 5/8	2 x 1	2 1/2 x 1 3/4
7/8 x 5/16	1 x 5/8	2 1/8 x 1	2 3/4 x 1 3/4
1 x 5/16	1 1/4 x 5/8	2 1/2 x 1	2 1/2 x 2
1 1/4 x 5/16	1 1/2 x 5/8	3 x 1	3 x 2
1 1/2 x 5/16	1 5/8 x 5/8	4 x 1	4 x 2
1 3/4 x 5/16	1 3/4 x 5/8	5 x 1	3 x 2 1/2
2 x 5/16	2 x 5/8	6 x 1	4 x 2 1/2
1/2 x 3/8	2 1/4 x 5/8	1 3/16 x 1 1/16	4 x 3
5/8 x 3/8	2 1/2 x 5/8	1 5/8 x 1 1/8	12 5/8 x 1
3/4 x 3/8	3 x 5/8	2 x 1 1/8	12 5/8 x 1 1/4
7/8 x 3/8	4 x 5/8	2 1/4 x 1 1/8	12 5/8 x 1 1/2
1 x 3/8	6 x 5/8	2 3/4 x 1 1/8	12 5/8 x 1 3/4
1 1/8 x 3/8	1 x 3/4	3 x 1 1/8	12 5/8 x 2
1 1/4 x 3/8	1 1/4 x 3/4	10 x 1 1/8	12 5/8 x 2 1/2
1 1/2 x 3/8	1 1/2 x 3/4	1 1/2 x 1 1/4	12 5/8 x 3
1 3/4 x 3/8	1 3/4 x 3/4	1 3/4 x 1 1/4	

SQUARES

1/4	5/8	1 1/8	2
5/16	11/16	1 1/4	2 1/2
3/8	3/4	1 3/8	3
7/16	7/8	1 1/2	4
1/2	1	1 3/4	*4 1/4
9/16			

* This size available in PX Temper (0.56% to 0.60% C).

REX AA HIGH SPEED ROUND TOOL BITS

Hardened and Ground

1/8 x 4 Long	9/16 x 4 Long	5/16 x 6 Long
5/32 x 4 "	5/8 x 4 "	3/8 x 6 "
3/16 x 4 "	3/4 x 4 "	7/16 x 6 "
7/32 x 4 "	7/8 x 4 "	1/2 x 6 "
1/4 x 4 "	1 x 4 "	9/16 x 6 "
5/16 x 4 "	1/8 x 6 "	5/8 x 6 "
3/8 x 4 "	3/16 x 6 "	3/4 x 6 "
7/16 x 4 "	1/4 x 6 "	7/8 x 6 "
1/2 x 4 "	9/32 x 6 "	1 x 6 "

REX AA HIGH SPEED TOOL BITS

Hardened—Ends Beveled

SQUARES

1/8 x 2 1/2 Long	3/8 x 3 Long	3/4 x 5 Long
1/8 x 6 "	7/16 x 3 1/2 "	7/8 x 6 "
3/16 x 2 1/2 "	1/2 x 4 "	1 x 7 "
1/4 x 2 1/2 "	9/16 x 4 "	1 1/4 x 9 "
5/16 x 2 1/2 "	5/8 x 4 1/2 "	

FLATS

3/4 x 1/8 x 5 Long	3/4 x 1/2 x 5 Long
3/8 x 1/4 x 3 "	1 x 1/2 x 7 "
1/2 x 1/4 x 4 "	7/8 x 5/8 x 6 "
7/16 x 5/16 x 3 1/2 "	1 x 3/4 x 7 "
1/2 x 3/8 x 4 "	

DOUBLE BEVELED (CUT OFF TOOLS)

1/2 x 3/32 x 1/16 x 4 1/2 Long	7/8 x 3/16 x 1/8 x 7 Long
5/8 x 3/32 x 1/16 x 5 "	1 x 3/16 x 1/8 x 8 "
3/4 x 1/8 x 1/16 x 6 "	1 1/8 x 3/16 x 1/8 x 9 "
7/8 x 1/8 x 1/16 x 7 "	1 x 1/4 x 3/16 x 8 "
1 x 1/8 x 1/16 x 8 "	1 1/4 x 1/4 x 3/16 x 10 "

REX AA HIGH SPEED TREATED BARS

30 Inch Lengths

NX Temper (0.71% to 0.75%C)

ROUNDS

1/4 5/16	3/8 7/16	1/2 5/8

FLATS

3/8 x 1/8 1/2 x 1/8 5/8 x 1/8 3/4 x 1/8 7/8 x 1/8 1 x 1/8 3/8 x 3/16	1/2 x 3/16 5/8 x 3/16 3/4 x 3/16 1 x 3/16 3/8 x 1/4 1/2 x 1/4 3/4 x 1/4	1 x 1/4 1 1/4 x 1/4 7/16 x 5/16 1/2 x 5/16 3/4 x 5/16 1 x 5/16	1/2 x 3/8 5/8 x 3/8 3/4 x 3/8 1 x 3/8 1 1/4 x 3/8 5/8 x 1/2	3/4 x 1/2 1 x 1/2 1 1/2 x 1/2 1 x 5/8 1 1/4 x 5/8 1 x 3/4

SQUARES

3/16 1/4	5/16 3/8	7/16 1/2	5/8 3/4	7/8 1

REX AA HIGH SPEED NAIL DIE STEEL BARS

Annealed

DOUBLE BEVELED (10)

# 8 15/8 x 1 1/8 # 10 1 1/2 x 15/16 # 11 1 1/2 x 13/16	# 14 1 3/8 x 13/16 # 16 1 1/8 x 11/16 # 19 15/16 x 9/16	# 21 15/16 x 11/16 # 23 13/16 x 9/16 # 26 11/16 x 7/16

REX AAA HIGH SPEED STEEL BARS

Carbon 0.75% **Tungsten 18.00%** **Chromium 4.00%**
Vanadium 1.15% **Molybdenum 0.75%** **Cobalt 5.00%**

Annealed

The 5% cobalt content of Rex AAA produces a high speed steel with greater red hardness, good wear resistance but with slightly less toughness than Rex AA. This steel is particularly recommended for continuous hogging cuts or where the tool must cut dry. Rex AAA is widely used for machining cast iron and non-ferrous alloys. It is generally used for single point tools.

ROUNDS

1/4	7/8	1 9/16	2 3/8	3 1/4
3/8	1	1 5/8	2 1/2	3 5/8
15/32	1 1/8	1 3/4	2 5/8	4 1/8
1/2	1 1/4	1 7/8	2 3/4	4 5/8
9/16	1 5/16	2	3	5 1/8
5/8	1 3/8	2 1/8	3 1/8	6 1/8
3/4	1 1/2	2 1/4		

FLATS

1 x 1/4	1 x 3/8	2 x 1/2	1 1/2 x 3/4	1 1/2 x 1 1/4
1 1/2 x 1/4	1 1/4 x 3/8	2 1/2 x 1/2	2 x 3/4	2 x 1 1/4
2 x 1/4	1 1/2 x 3/8	3 x 1/2	2 1/2 x 3/4	2 1/2 x 1 1/4
1/2 x 5/16	2 x 3/8	1 x 5/8	3 x 3/4	3 x 1 1/4
3/4 x 5/16	2 1/2 x 3/8	1 1/4 x 5/8	1 1/4 x 1	4 1/2 x 1 1/4
1 x 5/16	3/4 x 1/2	1 1/2 x 5/8	1 1/2 x 1	2 x 1 1/2
1 1/4 x 5/16	1 x 1/2	2 x 5/8	1 3/4 x 1	2 1/4 x 1 1/2
1 1/2 x 5/16	1 1/4 x 1/2	2 1/2 x 5/8	2 x 1	2 1/2 x 1 1/2
2 x 5/16	1 1/2 x 1/2	1 x 3/4	2 1/2 x 1	3 1/2 x 3
3/4 x 3/8	1 3/4 x 1/2	1 1/4 x 3/4	3 x 1	

SQUARES

1/4	1/2	7/8	1 1/2
5/16	9/16	1	1 3/4
3/8	5/8	1 1/8	2
7/16	3/4	1 1/4	3 1/2

REX AAA HIGH SPEED TOOL BITS

Hardened — Ends Beveled

SQUARES

3/16 x 2 1/2 Long	1/2 x 4 Long	7/8 x 6 Long
1/4 x 2 1/2 "	1/2 x 6 "	1 x 7 "
5/16 x 2 1/2 "	5/8 x 4 1/2 "	1 1/4 x 9 "
3/8 x 3 "	5/8 x 6 "	
7/16 x 3 1/2 "	3/4 x 5 "	

FLATS

3/8 x 1/4 x 3 Long	3/4 x 3/8 x 5 Long	7/8 x 5/8 x 6 Long
1/2 x 1/4 x 4 "	7/8 x 3/8 x 6 "	1 x 5/8 x 7 "
3/4 x 1/4 x 5 "	1 x 3/8 x 7 "	1 1/4 x 5/8 x 9 "
1 x 1/4 x 7 "	5/8 x 1/2 x 4 1/2 "	1 x 3/4 x 7 "
7/16 x 5/16 x 3 1/2 "	3/4 x 1/2 x 5 "	1 1/4 x 3/4 x 9 "
5/8 x 5/16 x 4 1/2 "	3/4 x 1/2 x 6 "	1 1/2 x 3/4 x 12 "
1/2 x 3/8 x 4 "	1 x 1/2 x 7 "	1 1/4 x 1 x 9 "
5/8 x 3/8 x 4 1/2 "	3/4 x 5/8 x 5 "	

DOUBLE BEVELED (CUT-OFF TOOLS)

5/8 x 3/32 x 1/16 x 5 Long	1 x 3/16 x 1/8 x 8 Long
3/4 x 1/8 x 1/16 x 6 "	1 1/8 x 3/16 x 1/8 x 9 "
7/8 x 1/8 x 1/16 x 7 "	1 1/4 x 1/4 x 3/16 x 10 "
1 x 1/8 x 1/16 x 8 "	

REX AAA HIGH SPEED TREATED BARS

30 Inch Lengths

SQUARES

1/4	7/16	5/8
5/16	1/2	3/4
3/8		

REX AAA HIGH SPEED TOOL BITS

Hardened and Ground — Ends Beveled

SQUARES

1/8 x 2 1/2 Long	3/8 x 3 Long	5/8 x 4 1/2 Long
3/16 x 2 1/2 "	7/16 x 3 1/2 "	3/4 x 5 "
1/4 x 2 1/2 "	1/2 x 4 "	1 x 7 "
5/16 x 2 1/2 "		

DOUBLE BEVELED (CUT-OFF BITS)

Hardened and Ground

1/2 x 3/32 x 1/16 x 4 1/2 Long	3/4 x 1/8 x 1/16 x 6 Long
5/8 x 3/32 x 1/16 x 5 "	7/8 x 1/8 x 1/16 x 7 "

REX 95 HIGH SPEED STEEL BARS

Carbon 0.80% **Tungsten 14.00%** **Chromium 4.00%**
Vanadium 2.00% **Molybdenum 0.75%** **Cobalt 5.25%**

Annealed

Rex 95 is a tungsten-vanadium-cobalt high speed steel which was developed to meet the requirements for a steel combining high red hardness, superior abrasion resistance and good toughness. This steel is recommended for severe cutting operations and especially for machining stainless steels. Rex 95 is generally used for single point tools.

FLATS

1 x 3/8	1 x 5/8

REX 95 HIGH SPEED TOOL BITS

Hardened and Ground — Ends Beveled

SQUARES

1/8 x 2 1/2 Long	3/8 x 3 Long	5/8 x 4 1/2 Long	1 1/4 x 9 Long
3/16 x 2 1/2 "	7/16 x 3 1/2 "	3/4 x 5 "	1 1/2 x 8 "
1/4 x 2 1/2 "	1/2 x 4 "	7/8 x 6 "	1 1/2 x 12 "
5/16 x 2 1/2 "	9/16 x 4 "	1 x 7 "	

REX 95 HIGH SPEED TOOL BITS

Hardened and Ground—Ends Beveled

FLATS

1/2 x 1/8 x 4 Long	3/4 x 5/16 x 5 Long	1 x 5/8 x 7 Long
5/8 x 5/32 x 4 1/4 "	1 x 5/16 x 7 "	1 1/4 x 5/8 x 9 "
3/8 x 3/16 x 3 "	5/8 x 3/8 x 4 1/2 "	1 1/2 x 5/8 x 12 "
1 x 3/16 x 7 "	1/2 x 3/8 x 4 "	1 x 3/4 x 7 "
5/16 x 1/4 x 1 3/8 "	3/4 x 3/8 x 5 "	1 1/4 x 3/4 x 9 "
3/8 x 1/4 x 3 "	1 x 3/8 x 7 "	1 1/2 x 3/4 x 7 "
1/2 x 1/4 x 4 "	5/8 x 1/2 x 4 1/2 "	1 1/2 x 3/4 x 8 "
5/8 x 1/4 x 4 1/2 "	3/4 x 1/2 x 5 "	1 1/2 x 3/4 x 12 "
3/4 x 1/4 x 5 "	1 x 1/2 x 7 "	1 x 7/8 x 7 "
1 x 1/4 x 7 "	1 1/4 x 1/2 x 6 "	1 1/4 x 1 x 7 "
1 1/4 x 1/4 x 9 "	1 1/4 x 1/2 x 9 "	1 1/4 x 1 x 9 "
3/8 x 5/16 x 3 "	1 1/2 x 1/2 x 7 "	1 1/2 x 1 x 9 "
7/16 x 5/16 x 3 1/2 "	1 1/2 x 1/2 x 12 "	1 1/2 x 1 x 12 "
1/2 x 5/16 x 4 "	3/4 x 5/8 x 5 "	1 1/2 x 1 1/4 x 9 "
5/8 x 5/16 x 4 1/2 "	7/8 x 5/8 x 6 "	

DOUBLE BEVELED CUT-OFF TOOLS

1 x 3/16 x 1/8 x 8 Long	1 1/4 x 1/4 x 3/16 x 10 Long
1 1/8 x 3/16 x 1/8 x 9 "	1 3/8 x 1/4 x 3/16 x 11 "

REX 95 WHEEL LATHE TOOL INSERTS

Hardened and Ground

ROUNDS

1 1/2 Round x 2 1/4 Long

REX 4-V HOT ROLLED ANNEALED BARS

Carbon 1.25% **Chromium 4.00%** **Vanadium 4.00%**
Tungsten 18.50% **Molybdenum 0.75%**

Rex 4-V is a special-purpose high speed steel, designed to give maximum performance in cutting extremely abrasive materials or under any conditions demanding high anti-wear properties in the tool. This steel has high resistance to cratering and will run to great advantage under high speeds and light cuts. Broaches, reamers, rifling and form tools are typical applications for Rex 4-V.

ROUNDS

1/2	1 1/8	1 7/8	3 1/8
5/8	1 1/4	2 1/8	3 5/8
3/4	1 1/2	2 3/8	4 1/8
1	1 3/4	2 5/8	

SQUARES

1/4	3/8	1/2	3/4
11/32	7/16	5/8	

REX 4-V HIGH SPEED TOOL BITS

Hardened and Ground

ROUNDS

1/8 x 4 Long	1/2 x 4 Long
3/16 x 4 "	1/4 x 6 "
1/4 x 4 "	5/16 x 6 "
5/16 x 4 "	3/8 x 6 "
3/8 x 4 "	1/2 x 6 "

SQUARES

3/16 x 2 1/2 Long	7/16 x 3 1/2 Long	7/8 x 6 Long
1/4 x 2 1/2 "	1/2 x 4 "	1 x 7 "
5/16 x 2 1/2 "	5/8 x 4 1/2 "	1 1/4 x 9 "
3/8 x 3 "	3/4 x 5 "	1 1/2 x 10 "

FLATS

1/2 x 3/32 x 4 1/2 Long	1/2 x 1/8 x 4 1/2 Long	1/2 x 5/16 x 4 Long

REX SUPERVAN HIGH SPEED STEEL BARS

Carbon 0.85% **Tungsten 18.50%** **Chromium 4.00%**

Vanadium 2.10% **Molybdenum 0.75%**

Annealed

Rex Supervan due to its high vanadium content has remarkable characteristics for maintaining a sharp, keen cutting edge combined with good toughness. It is the standard steel where maximum abrasion resistance is required.

ROUNDS

1/2	1 1/8	1 7/8	3
9/16	1 3/16	2	3 1/16
5/8	1 1/4	2 1/8	3 1/8
11/16	1 5/16	2 1/4	3 1/2
3/4	1 3/8	2 5/16	3 3/4
13/16	1 7/16	2 3/8	4
7/8	1 1/2	2 1/2	4 1/8
15/16	1 5/8	2 5/8	4 1/4
1	1 3/4	2 3/4	4 1/2
1 1/16	1 13/16	2 7/8	

FLATS

7/8 x 3/8	1 1/4 x 3/4	2 1/2 x 7/8	1 5/8 x 1 1/8
1 3/8 x 3/8	1 1/2 x 3/4	1 1/8 x 1	1 3/4 x 1 1/8
3/4 x 1/2	1 3/4 x 3/4	1 1/4 x 1	1 3/8 x 1 1/4
7/8 x 1/2	1 7/8 x 3/4	1 3/8 x 1	1 1/2 x 1 1/4
1 x 1/2	2 x 3/4	1 1/2 x 1	1 3/4 x 1 1/4
1 1/8 x 1/2	1 x 7/8	1 3/4 x 1	2 x 1 1/4
1 1/4 x 1/2	1 1/8 x 7/8	2 x 1	2 1/4 x 1 1/4
1 x 5/8	1 1/4 x 7/8	2 1/8 x 1	2 1/2 x 1 1/4
1 1/8 x 5/8	1 1/2 x 7/8	2 1/4 x 1	3 x 1 1/4
1 1/4 x 5/8	1 5/8 x 7/8	2 3/8 x 1	1 3/4 x 1 1/2
1 1/2 x 5/8	1 3/4 x 7/8	2 1/2 x 1	2 x 1 1/2
1 3/4 x 5/8	1 7/8 x 7/8	3 x 1	2 1/4 x 1 1/2
2 x 5/8	2 x 7/8	1 1/4 x 1 1/8	2 3/4 x 1 1/2
1 x 3/4	2 1/8 x 7/8	1 1/2 x 1 1/8	3 x 1 1/2
1 1/8 x 3/4	2 1/4 x 7/8		

SQUARES

1/2	1	1 3/8	1 3/4
5/8	1 1/8	1 1/2	2
3/4	1 1/4	1 5/8	

REX SUPERVAN HIGH SPEED TOOL BITS

Hardened — Ends Beveled

SQUARES

1/4 x 2 1/2 Long	7/16 x 3 1/2 Long	5/8 x 4 1/2 Long
3/8 x 3 "	1/2 x 4 "	3/4 x 5 "

REX 440 HIGH SPEED STEEL BARS

Carbon 0.80% Chromium 4.00% Cobalt 12.00% Tungsten 19.50% Vanadium 2.00% Molybdenum 0.60%

Annealed

Rex 440 High Speed Steel is a highly alloyed cobalt steel for use where the ultimate in red hardness is required. To secure this extreme in red hardness, some sacrifice of toughness has been necessary. For this reason all tools should be supported full length and interrupted cuts avoided. Single point tools only are recommended for extremely heavy cuts where high tool temperatures are developed. Due to its high cobalt content protection during hardening is important unless complete grinding is possible.

ROUNDS

1 1/2	1 3/4	2 5/16

REX 440 TOOL BITS

Hardened and Ground

SQUARES

1/4 x 2 1/2 Long	7/16 x 3 1/2 Long	3/4 x 5 Long
5/16 x 2 1/2 "	1/2 x 4 "	7/8 x 6 "
3/8 x 3 "	5/8 x 4 1/2 "	1 x 7 "

REX 440 WHEEL LATHE TOOL INSERTS

1 1/2 Round x 2 1/4 Long

REX CHAMPION HIGH SPEED STEEL

Carbon 0.73% **Chromium 4.00%**
Vanadium 2.00% **Tungsten 14.00%**

Rex Champion is particularly adapted to the cutting of heat treated alloy steels, sand castings, hard alloys or gritty materials where toughness and resistance to abrasion are essential.

REX CHAMPION HIGH SPEED TOOL BITS

SQUARES

5/16 x 2 1/2 Long	3/8 x 3 Long	1/2 x 4 Long

REX SUPERCUT HIGH SPEED TOOL BITS

Carbon 0.80% **Chromium 4.00%** **Cobalt 8.00%**
Tungsten 18.50% **Molybdenum 0.60%** **Vanadium 2.00%**

Hardened-Ground

Rex Supercut is a tungsten-vanadium-cobalt high speed steel properly designed to provide a steel with excellent red hardness and superior abrasion resistance, yet with a good degree of toughness. Rex Supercut is particularly suited for heavy dry cuts and interrupted cuts on heat treated material and castings.

SQUARES

3/16 x 2 1/2 Long	7/16 x 3 1/2 Long	7/8 x 6 Long
1/4 x 2 1/2 "	1/2 x 4 "	1 x 7 "
5/16 x 2 1/2 "	5/8 x 4 1/2 "	1 1/4 x 9 "
3/8 x 3 "	3/4 x 5 "	

FLATS

1/2 x 1/4 x 4 Long	1 x 1/2 x 7 Long
1/2 x 3/8 x 4 "	1 1/4 x 1/2 x 7 "
3/4 x 3/8 x 5 "	1 x 3/4 x 7 "
3/4 x 1/2 x 5 "	1 1/4 x 3/4 x 6 "
3/4 x 1/2 x 6 "	1 1/2 x 3/4 x 6 "

REX TMO BARS ANNEALED

Carbon 0.74% **Chromium 3.75%** **Vanadium 1.15%**
Tungsten 1.55% **Molybdenum 8.70%**

Rex TMO is a molybdenum tungsten type of high speed steel, is tough high speed steel with high cutting efficiency and excellent finishing properties. It is adapted to fast light cuts on soft or medium hard materials. In the lower carbon range Rex TMO is successfully used for hot work applications requiring high abrasion resistance.

ROUNDS

.72-.76% CARBON

9/16	1 13/16	2 1/2	3 3/8
5/8	2	2 3/4	3 3/4
11/16	2 3/8	3	

PLASTIC MOLD AND DIE CASTING DIE STEELS

Index

PLASTIC MOLD AND DIE CASTING DIE STEELS

Index

NU-DIE V DIE CASTING DIE STEEL

Carbon 0.40% **Silicon 1.05%** **Chromium 5.00%**
Molybdenum 1.35% **Vanadium 1.10%**

NU-DIE V is an outstanding die casting steel for aluminum and magnesium die casting dies. It is also recommended for long run zinc dies, die inserts, slides, sleeves and plungers.

FLATS

1 x ¾	4½ x 2¼	8 x 1	14 x 5½
1⅛ x ⅜	5 x ¾	8 x 1½	14 x 6
1½ x 1¾	5 x 1	8 x 2	16 x 2
1½ x ¾	5 x 1½	8 x 2½	16 x 2½
2 x ¾	5 x 2	8 x 3	16 x 3
2 x 1	5 x 2¼	8 x 4	16 x 3½
2 x 1½	5 x 2½	8 x 5	16 x 4
2¼ x 1⅜	5 x 3	10 x 2	16 x 4½
3 x ¾	5 x 3½	10 x 2½	16 x 5
3 x 1	5 x 4	10 x 3	16 x 5½
3 x 1½	5¼ x 1¾	10 x 3½	16 x 6
3 x 1¾	5¼ x 2	10 x 4	16 x 7
3 x 2	5¼ x 2¼	10 x 5	18 x 2½
3 x 2½	6 x ¾	12 x 1¼	18 x 3
3 x 2¾	6 x 1	12 x 1½	18 x 3½
3¼ x 1½	6 x 1¼	12 x 2	18 x 4
3¼ x 3	6 x 1½	12 x 2½	18 x 4½
3½ x 1½	6 x 2	12 x 3	18 x 5
3⅞ x 3¼	6 x 2½	12 x 3½	18 x 5½
4 x ¾	6 x 3	12 x 4	18 x 6
4 x 1	6 x 3½	12 x 4½	18 x 6½
4 x 1½	6 x 4	12 x 5	18 x 7
4 x 2	6 x 5	12 x 5½	18 x 8
4 x 2½	6 3/16 x 2 3/16	12 x 6	20 x 4
4 x 3	7 x 1	12½ x 3½	20 x 4¼
4 x 3½	7 x 1½	14 x 1½	20 x 4½
4¼ x 1¾	7 x 2	14 x 2½	20 x 5
4¼ x 2	7 x 2½	14 x 3	20 x 5½
4¼ x 2¼	7 x 3	14 x 3½	20 x 6
4¼ x 2½	7 x 3½	14 x 4	20 x 7
4¼ x 3	7 x 4	14 x 4½	20 x 8
4½ x 1¾	7 x 5	14 x 5	25 x 6
4½ x 2			

Stocked oversize to allow for finishing of sizes shown.

NU-DIE V DIE CASTING DIE STEEL—*Continued*

SQUARES

½	1½	2¼	4	8
1	1¾	2½	5	10
1¼	2	3	6	12

Stocked oversize to allow for finishing of sizes shown.

ROUNDS

½	1⅝	2¾	4¼	6¼
⅝	1¾	3	4½	6½
¾	1⅞	3⅛	4¾	6¾
⅞	2	3¼	5	7
1	2 3/16	3½	5⅛	7¼
1⅛	2¼	3⅝	5¼	8
1¼	2⅜	3¾	5½	8½
1⅜	2½	4	5¾	9
1 7/16	2⅝	4⅛	6	10
1½				

SQUARE BILLETS

6	8	10	12	14

NU-DIE V HOLLOW TOOL STEEL BARS

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2¼ O.D. x 1 I.D.	4½ O.D. x 2 I.D.	5½ O.D. x 2½ I.D.
2½ " x 1¼ "	4½ " x 2½ "	5½ " x 3 "
3 " x 1½ "	4¾ " x 1¾ "	6 " x 2¼ "
3¼ " x 1½ "	5 " x 1½ "	6 " x 3 "
4 " x 1¾ "	5 " x 2 "	6¼ " x 3 9/16 "
4 " x 2¼ "	5 " x 2½ "	6¾ " x 3⅝ "
4¼ " x 2 "	5 " x 3 "	7¼ " x 3¾ "
4¼ " x 2⅜ "	5½ " x 2 "	

CSM 2 TOOL STEEL

Carbon 0.30% **Manganese 0.75%** **Silicon 0.50%**
Molybdenum 0.25% **Chromium 0.80%**

CSM 2 is an electric furnace tool steel produced for machine cut plastic molds, zinc die casting dies and die casting holder blocks.

FLATS

Flat bars are stocked to a hardness of 197-228 Brinell and 290-320 Brinell.

1 x ¾	7 x 1	12 x 6	20 x 6
1½ x ¾	7 x 1½	12 x 8	20 x 7
1½ x 1	7 x 2	14 x 2	20 x 8
2 x ¾	7 x 2½	14 x 2¼	20 x 9
2 x 1	7 x 3	14 x 2½	20 x 10
2 x 1½	7 x 3½	14 x 2¾	20 x 11
3 x ¾	7 x 4	14 x 3	20 x 12
3 x 1	7 x 5	14 x 3½	20 x 15
3 x 1½	8 x ¾	14 x 4	22 x 5
3 x 2	8 x 1	14 x 4½	22 x 10
3 x 2½	8 x 1¼	14 x 5	23 x 6
4 x ¾	8 x 1½	16 x 2	24 x 4
4 x 1	8 x 2	16 x 2½	24 x 5
4 x 1½	8 x 2½	16 x 3	24 x 10
4 x 2	8 x 3	16 x 3½	24 x 12
4 x 2½	8 x 3½	16 x 4	25 x 4
4 x 3	8 x 4	16 x 4½	25 x 5
4 x 3½	10 x ¾	16 x 5	25 x 6
5 x ¾	10 x 1¼	16 x 5½	25 x 8
5 x 1	10 x 1½	16 x 6	25 x 9
5 x 1½	10 x 2	16 x 7	25 x 10
5 x 2	10 x 2½	16 x 8	25 x 11
5 x 2½	10 x 3	18 x ⅝	25 x 12
5 x 3	10 x 3½	18 x 1	25 x 15
5 x 3½	10 x 4	18 x 1½	30 x 4
5 x 4	10 x 4½	18 x 2	30 x 6
5½ x 3½	12 x ⅝	18 x 3	30 x 8
6 x ¾	12 x 1	18 x 4	30 x 10
6 x 1	12 x 1¼	18 x 4½	30 x 12
6 x 1¼	12 x 1½	18 x 5	36 x 4
6 x 1½	12 x 2	18 x 6	36 x 6
6 x 2	12 x 2¼	18 x 7	36 x 8
6 x 2½	12 x 2½	18 x 8	40 x 4
6 x 3	12 x 2¾	20 x 1½	40 x 6
6 x 3½	12 x 3	20 x 2	40 x 8
6 x 4	12 x 3½	20 x 3	40 x 10
6 x 5	12 x 4	20 x 4	40 x 12
6 3/16 x 2 3/16	12 x 5	20 x 5	

Stocked oversize to allow for finishing to sizes shown.

CSM 2 TOOL STEEL BARS—*Continued*

ROUNDS

Round bars are stocked to a hardness of 197-328 Brinell.

1/2	1 3/4	2 5/8	4 1/2	7 1/2
3/4	1 7/8	2 3/4	5	8
1	2	3	5 1/2	9
1 1/4	2 1/8	3 1/4	6	10
1 3/8	2 1/4	3 1/2	6 1/2	11
1 1/2	2 1/2	3 3/4	7	12
1 5/8				

SQUARES

Square bars are stocked to a hardness of 290-320 Brinell.

1	2	2 1/2	4	6
1 1/2	2 1/16	3	5	8

Stocked oversize to allow for finishing to sizes shown.

GROUND AND POLISHED DRILL ROD

1/16	3/32	1/8	3/16

ROUND CORNERED SQUARE BILLETS

4	6	8	10	12

NU-DIE GROUND AND POLISHED DRILL ROD

Carbon 0.40% **Silicon 1.05%** **Chromium 5.00%**
Vanadium 0.35% **Molybdenum 1.35%**

Nu-Die Drill Rods are widely used in the die casting industry for such applications as cores and various types of pins.

GROUND AND POLISHED

Gauge or Nearest Fractional Dimensions	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimensions*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimensions*	*Size Decimals of an Inch*
3/32	.0937	11/32	.3437	21/32	.6562
1/8	.125	3/8	.375	11/16	.6875
5/32	.1562	13/32	.4062	23/32	.7187
3/16	.1875	7/16	.4375	47/64	.7343
7/32	.2187	15/32	.4687	3/4	.750
1/4	.250	1/2	.500	13/16	.8125
17/64	.2656	9/16	.5625	7/8	.875
9/32	.2812	5/8	.625	1	1.000
5/16	.3125				

FORMOLD

Annealed

Carbon 0.07% Max. **Chromium 2.00%** **Nickel 0.55%**
Manganese 0.65% **Molybdenum 0.20%**

Formold is an electric furnace alloy cold hubbing mold steel having a core strength equal to that of the AISI 3110 type mold steels, with cold hubbing properties better than AISI 3110 and approaching that of the low carbon iron mold steels.

ROUNDS

2 2¼	2½ 3	3½ 4	4½ 5	6

SQUARES

1½ 2	2½ 3	3½ 4	5	6 (Billets) 8 (Billets)

FLATS

2 x 1½	4 x 2	5 x 2½	7 x 3
3 x 1½	5 x 2	6 x 2½	6 x 3½
4 x 1½	6 x 2	4 x 3	5 x 4
2½ x 2	3 x 2½	5 x 3	6 x 4
3 x 2	4 x 2½	6 x 3	7 x 5

REX AA HIGH SPEED ROUND TOOL BITS

Carbon 0.73% **Tungsten 18.00%** **Chromium 4.00%** **Vanadium 1.15%**

Hardened and Ground

1/8 x 4 Long	9/16 x 4 Long	5/16 x 6 Long
5/32 x 4 "	5/8 x 4 "	3/8 x 6 "
3/16 x 4 "	3/4 x 4 "	7/16 x 6 "
7/32 x 4 "	7/8 x 4 "	1/2 x 6 "
1/4 x 4 "	1 x 4 "	9/16 x 6 "
5/16 x 4 "	1/8 x 6 "	5/8 x 6 "
3/8 x 4 "	3/16 x 6 "	3/4 x 6 "
7/16 x 4 "	1/4 x 6 "	7/8 x 6 "
1/2 x 4 "	9/32 x 6 "	1 x 6 "

AIR HARDENING STEELS

Index

AIR HARDENING STEELS

Index

HYCC TOOL STEEL BARS

Carbon 2.25% **Chromium 11.50%** **Molybdenum 0.80%** **Vanadium 0.20%**

Annealed

HYCC is a high carbon high chromium tool steel particularly adaptable for the making of blanking dies and punches from which long production runs are required. Due to its wear resisting property, this steel is likewise adaptable to high production forming operations. HYCC is an air hardening steel but may also be hardened by quenching in oil.

ROUNDS

1/4	1 1/8	2 1/8	3 1/2	5 1/2
5/16	1 1/4	2 1/4	3 3/4	6
3/8	1 3/8	2 1/2	4	6 1/4
1/2	1 1/2	2 5/8	4 1/4	6 1/2
9/16	1 5/8	2 3/4	4 1/2	7
5/8	1 3/4	3	4 3/4	8
3/4	1 7/8	3 1/8	5	8 1/2
7/8	2	3 1/4	5 1/4	10
1				

FLATS

1/2 x 1/4	1 x 5/8	7 x 1	7 x 1 1/2
1 x 1/4	1 1/4 x 5/8	8 x 1	8 x 1 1/2
1 1/8 x 1/4	2 x 5/8	9 1/8 x 1	10 x 1 1/2
1 1/2 x 1/4	2 1/4 x 5/8	1 1/2 x 1 1/4	2 x 1 3/4
2 x 1/4	2 1/2 x 5/8	2 x 1 1/4	2 1/2 x 1 3/4
2 1/2 x 1/4	1 x 3/4	2 1/2 x 1 1/4	3 x 1 3/4
4 x 1/4	1 1/4 x 3/4	3 x 1 1/4	4 x 1 3/4
5 x 1/4	1 1/2 x 3/4	4 x 1 1/4	2 1/2 x 2
3/4 x 3/8	2 x 3/4	4 1/2 x 1 1/4	3 x 2
1 x 3/8	2 1/2 x 3/4	5 x 1 1/4	3 1/2 x 2
1 1/2 x 3/8	3 x 3/4	6 x 1 1/4	4 x 2
2 x 3/8	3 1/2 x 3/4	7 x 1 1/4	4 1/2 x 2
2 1/2 x 3/8	4 x 3/4	8 x 1 1/4	5 x 2
3 x 3/8	5 x 3/4	10 x 1 1/4	5 1/2 x 2
3/4 x 1/2	6 x 3/4	12 x 1 1/4	6 x 2
1 x 1/2	1 1/4 x 1	1 3/4 x 1 1/2	8 x 2
1 1/4 x 1/2	1 1/2 x 1	2 x 1 1/2	10 x 2
1 1/2 x 1/2	1 3/4 x 1	2 1/2 x 1 1/2	3 x 2 1/2
1 3/4 x 1/2	2 x 1	2 3/4 x 1 1/2	4 x 2 1/2
2 x 1/2	2 1/2 x 1	3 x 1 1/2	5 x 2 1/2
2 1/2 x 1/2	3 x 1	3 1/2 x 1 1/2	6 x 2 1/2
3 x 1/2	3 1/2 x 1	4 x 1 1/2	4 x 3
3 1/2 x 1/2	4 x 1	5 x 1 1/2	5 x 3
4 x 1/2	5 x 1	6 x 1 1/2	6 x 3
3/4 x 5/8	6 x 1		

HYCC TOOL STEEL BARS—*Continued*

SQUARES

1/2	1 1/4	2	3	4 1/4
5/8	1 1/2	2 1/4	3 1/2	4 1/2
3/4	1 3/4	2 1/2	4	6
1				

SQUARE BILLETS

3	4	6	8

AIRDI 150 TOOL STEEL BARS

Carbon 1.50% **Chromium 11.50%** **Molybdenum 0.80%** **Vanadium 0.90%**

Annealed

Airdi 150 is the outstanding high carbon, high chromium tool steel for general use. The most important characteristic of this air hardening die steel is its resistance to abrasion. Size change during hardening is negligible. Airdi 150 may also be hardened in oil from slightly lower hardening temperatures than when it is air cooled. Oil quenching may cause a little size change or distortion.

ROUNDS

1/4	1 3/8	2 3/4	4 3/4	8 1/8
5/16	1 1/2	2 7/8	5	8 1/2
3/8	1 5/8	3	5 1/2	8 3/4
7/16	1 3/4	3 1/8	5 3/4	9
1/2	1 7/8	3 1/4	6	9 1/8
3/8	2	3 1/2	6 1/4	9 5/8
11/16	2 1/8	3 3/4	6 1/2	10
3/4	2 1/4	4	7	10 1/8
7/8	2 3/8	4 1/4	7 1/8	10 3/4
1	2 1/2	4 1/2	7 1/2	11 1/8
1 1/8	2 5/8	4 5/8	8	12
1 1/4				

AIRDI 150 TOOL STEEL BARS

Annealed

FLATS

½ x ¼	1¼ x ¾	4 x 1¼	4½ x 2
¾ x ¼	1½ x ¾	4½ x 1¼	5 x 2
1 x ¼	1¾ x ¾	5 x 1¼	5½ x 2
½ x ¼	2 x ¾	6 x 1¼	6 x 2
2 x ¼	2½ x ¾	8 x 1¼	7 x 2
2½ x ¼	3 x ¾	10 x 1¼	8 x 2
3 x ¼	3½ x ¾	2 x 1½	10 x 2
4 x ¼	4 x ¾	2¼ x 1½	12 x 2
½ x ⅜	6 x ¾	2½ x 1½	3 x 2¼
⅝ x ⅜	2¼ x ⅞	2¾ x 1½	3½ x 2¼
¾ x ⅜	1¼ x 1	3 x 1½	4 x 2¼
1 x ⅜	1½ x 1	3½ x 1½	5 x 2¼
1¼ x ⅜	1¾ x 1	4 x 1½	6 x 2¼
1½ x ⅜	2 x 1	4½ x 1½	3 x 2½
2 x ⅜	2¼ x 1	5 x 1½	3½ x 2½
2½ x ⅜	2½ x 1	6 x 1½	4 x 2½
3 x ⅜	2¾ x 1	7 x 1½	4½ x 2½
¾ x ½	3 x 1	8 x 1½	5 x 2½
1 x ½	3½ x 1	10 x 1½	6 x 2½
1¼ x ½	4 x 1	12 x 1½	8 x 2½
1½ x ½	4½ x 1	2 x 1¾	3½ x 3
2 x ½	5 x 1	2½ x 1¾	4 x 3
2½ x ½	6 x 1	3 x 1¾	4½ x 3
3 x ½	7 x 1	3¼ x 1¾	5 x 3
4 x ½	8 x 1	3½ x 1¾	6 x 3
6 x ½	10 x 1	4 x 1¾	8 x 3
¾ x ⅝	1½ x 1¼	4½ x 1¾	9 x 3
1 x ⅝	1¾ x 1¼	5 x 1¾	10 x 3
1¼ x ⅝	2 x 1¼	6 x 1¾	4 x 3½
1½ x ⅝	2⅛ x 1¼	2¼ x 2	4½ x 3½
2 x ⅝	2¼ x 1¼	2⅜ x 2	5 x 3½
2¼ x ⅝	2½ x 1¼	2½ x 2	6 x 3½
2½ x ⅝	2¾ x 1¼	3 x 2	5 x 4
3 x ⅝	3 x 1¼	3½ x 2	6 x 4
4 x ⅝	3¼ x 1¼	4 x 2	8 x 4
1 x ¾	3½ x 1¼		

AIRDI 150 TOOL STEEL BARS—*Continued*

Annealed

SQUARES

½	1¼	2½	4
⅝	1½	2¾	5
¾	1¾	3	6
⅞	2	3½	8
1	2¼		

SQUARE BILLETS

4	6	8	10	12

AIRDI 150 HOLLOW TOOL STEEL BARS

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2 O.D. x 1 I.D.	5½ O.D. x 2½ I.D.	9 O.D. x 4 I.D.
3 " x 1 "	6 " x 1¾ "	9 " x 5 "
3¼ " x 1¼ "	6 " x 3 "	10 " x 6 "
3½ " x 1 "	6½ " x 3¼ "	11 " x 6 "
3½ " x 2 "	6½ " x 4 "	11 " x 7 "
4 " x 1½ "	7 " x 2¼ "	12 " x 5 "
4 " x 2 "	7 " x 3½ "	12 " x 6 "
4¼ " x 1¾ "	7½ " x 4 "	13 " x 6 "
4½ " x 2 "	7¾ " x 4 "	13 " x 8 "
5 " x 2 "	8 " x 5 "	14 " x 7 "
5 " x 2½ "	8¼ " x 3½ "	15 " x 9 "
5½ " x 1¾ "	8½ " x 5¼ "	16 " x 10 "

AIRKOOL DIE STEEL BARS

Carbon 1.00% **Manganese 0.40%** **Chromium 5.25%**
Molybdenum 1.15% **Vanadium 0.40%**

Annealed

Airkool is an air hardening tool and die steel, intermediate in abrasion resistance between the oil hardening and high carbon, high chromium types. It possesses superior toughness characteristics to either of these types, together with excellent non-deforming properties and machines very readily. It may be broached and filed easily. This steel is particularly suited for applications which call for toughness and fairly high abrasion resistance. It is a deep hardening steel.

ROUNDS

1/4	1 1/2	2 3/4	4 3/4	8
3/8	1 5/8	2 7/8	5	8 1/2
1/2	1 3/4	3	5 1/4	9
5/8	1 7/8	3 1/4	5 1/2	9 1/2
3/4	2	3 1/2	6	10
7/8	2 1/8	3 5/8	6 1/4	10 1/8
1	2 1/4	3 3/4	6 1/2	10 5/8
1 1/8	2 3/8	4	7	11
1 1/4	2 1/2	4 1/4	7 1/8	12
1 3/8	2 5/8	4 1/2	7 1/2	

FLATS

1 1/2 x 3/8	6 x 1/2	2 x 3/4	1 1/4 x 1
2 x 3/8	8 x 1/2	2 1/2 x 3/4	1 1/2 x 1
2 1/4 x 3/8	1 1/4 x 5/8	2 3/4 x 3/4	1 3/4 x 1
3 x 3/8	1 1/2 x 5/8	3 x 3/4	2 x 1
4 x 3/8	2 x 5/8	3 1/4 x 3/4	2 1/2 x 1
6 x 3/8	2 1/2 x 5/8	3 1/2 x 3/4	3 x 1
3/4 x 1/2	3 x 5/8	3 3/4 x 3/4	3 1/2 x 1
1 x 1/2	4 x 5/8	4 x 3/4	4 x 1
1 1/4 x 1/2	6 x 5/8	4 1/4 x 3/4	4 1/2 x 1
1 1/2 x 1/2	8 x 5/8	4 1/2 x 3/4	4 3/4 x 1
2 x 1/2	10 x 5/8	5 x 3/4	5 x 1
2 1/2 x 1/2	1 x 3/4	6 x 3/4	5 1/4 x 1
3 x 1/2	1 1/4 x 3/4	7 x 3/4	6 x 1
4 x 1/2	1 1/2 x 3/4	8 x 3/4	7 x 1
5 x 1/2	1 3/4 x 3/4	10 x 3/4	8 x 1

AIRKOOL DIE STEEL BARS—*Continued*

FLATS—*Continued*

10 x 1	4½ x 1½	4½ x 2	12 x 2½
12 x 1	5 x 1½	5 x 2	3½ x 2¾
1½ x 1¼	5½ x 1½	5½ x 2	3½ x 3
1¾ x 1¼	6 x 1½	6 x 2	4 x 3
2 x 1¼	6½ x 1½	6½ x 2	5 x 3
2¼ x 1¼	7 x 1½	7 x 2	6 x 3
2½ x 1¼	7½ x 1½	8 x 2	7 x 3
3 x 1¼	8 x 1½	9 x 2	8 x 3
3¼ x 1¼	9 x 1½	10 x 2	10 x 3
3½ x 1¼	10 x 1½	12 x 2	12 x 3
4 x 1¼	12 x 1½	2½ x 2¼	8 x 3⅛
4¼ x 1¼	2 x 1¾	2¾ x 2¼	10 x 3⅛
4½ x 1¼	2¼ x 1¾	3 x 2¼	4 x 3½
5 x 1¼	2½ x 1¾	4 x 2¼	4½ x 3½
5½ x 1¼	2¾ x 1¾	5 x 2¼	5 x 3½
6 x 1¼	3 x 1¾	6 x 2¼	5½ x 3½
6½ x 1¼	3½ x 1¾	2¾ x 2½	6 x 3½
7 x 1¼	4 x 1¾	3 x 2½	7 x 3½
8 x 1¼	4½ x 1¾	3¼ x 2½	6¾ x 3¾
9 x 1¼	5 x 1¾	3½ x 2½	6¾ x 3¾
10 x 1¼	6 x 1¾	4 x 2½	4½ x 4
12 x 1¼	7 x 1¾	4½ x 2½	5 x 4
1¾ x 1½	8 x 1¾	5 x 2½	6 x 4
2 x 1½	10 x 1¾	5½ x 2½	7 x 4
2¼ x 1½	2¼ x 2	6 x 2½	8 x 4
2½ x 1½	2½ x 2	6½ x 2½	10 x 4
2¾ x 1½	2¾ x 2	7 x 2½	12 x 4
3 x 1½	3 x 2	8 x 2½	6 x 4½
3½ x 1½	3½ x 2	9 x 2½	6 x 5
4 x 1½	4 x 2	10 x 2½	6¾ x 5½
4¼ x 1½			

SQUARES

⅜	1	2¼	4¼
½	1¼	2½	4½
⅝	1½	3	5
¾	1¾	3¼	6
⅞	2	3½	8
		4	10

AIRKOOL DIE STEEL BARS—*Continued*

SQUARE BILLETS

6	8	10	12

AIRKOOL HOLLOW TOOL STEEL

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2 O.D. x 1 I.D.	6 " x 2 "	10 " x 6 "
2¼ " x 1 "	6½ " x 3 "	11 " x 3½ "
3 " x 1 "	7 " x 3 "	11 " x 5 "
3 " x 1½ "	7 O.D. x 4 I.D.	11 " x 7 "
3¼ " x 1½ "	7½ " x 4 "	12 " x 3½ "
3½ O.D. x 1½ I.D.	8 " x 4 "	12 O.D. x 6½ I.D.
4 " x 2 "	8 " x 5 "	12 " x 8 "
4 " x 2¼ "	8½ " x 4 "	13 " x 8 "
5 " x 2 "	9 " x 3½ "	14 " x 8 "
5 " x 2¾ "	9 " x 4 "	14 " x 10 "
5 O.D. x 3 I.D.	9 O.D. x 6 I.D.	15 " x 8 "
5½ " x 2½ "	10 " x 3½ "	16 " x 10 "

TOOL STEEL ELECTRODES

●

AIRKOOL AIR HARDENING ELECTRODES

Airkool Air Hardening Electrodes are designed for welding in a wide variety of applications such as: cold extrusion dies, blanking dies, drawing dies and rings, hot trimming dies, burnishing rolls, etc. The high carbon-high chromium type is seldom used where shock is a prime factor, due to its tendency to fatigue. However, the deposit of Airkool Air Hardening Electrodes does not have this fatigue characteristic and may be used to make repairs to the high chromium type, with greatly improved resistance to fatigue.

Properties of Weld Metal—Deposits of these electrodes are wear resisting, with characteristics of air hardening 5% chromium non-deforming tool steels, air or oil quenched. "As-welded" hardness is approximately 58-60 Rockwell C, and may be annealed, reheat treated or tempered to any degree of hardness.

Heat Treatment—Anneal 1500-1600 F. Harden 1750-1850 F. Quench in air. Temper 300-1000 F. See Airkool data sheet.

Preheating—In making a repair to an oil hardening steel or in composite fabrication, preheat to 400-500 F. In repairing an air hardening steel, preheat to 700-900 F and keep the unit within this range during welding. If unit or die is too large to retain heat, work should be kept on hot plate during welding.

Postheating or tempering—See recommendations in Crucible Tool Steel data sheets.

ROUNDS

3/32	1/8	5/32

Approximate Current Settings—3/32—60-90; 1/8—75-125; 5/32—100-150.
Identification—End color—yellow.

AIRKOOL-S DIE STEEL

Carbon 1.00% **Vanadium 0.40%** **Chromium 5.25%**
Manganese 0.40% **Sulphur 0.15%** **Molybdenum 1.15%**

Airkool-S is the sulphur-bearing counterpart or modification of the regular Airkool Die Steel. It has been designed for use where extensive machining is encountered. Under normal conditions, it will provide an improvement in "machinability" of about 25 to 35%, together with an expected increase in tool life. In addition to these characteristics Airkool-S embodies all the advantages of the standard Airkool, which is an air hardening tool and die steel intermediate in abrasion resistance between the oil hardening and high carbon high chromium types. It possesses superior toughness characteristics to either of these types, together with excellent non-deforming properties and machines very readily. It may be broached and filed easily. This steel is particularly suited for applications which call for toughness and fairly high abrasive resistance. It is a deep hardening steel.

Hot Rolled Annealed

ROUNDS

1/4	1 1/8	2	3	5
3/8	1 1/4	2 1/8	3 1/4	5 1/2
1/2	1 3/8	2 1/4	3 1/2	6
5/8	1 1/2	2 3/8	3 3/4	7
3/4	1 5/8	2 1/2	4	9
7/8	1 3/4	2 5/8	4 1/2	10
1	1 7/8	2 3/4		

FLATS

1 1/2 x 3/8	3 x 1/2	1 1/2 x 3/4	5 x 1
2 x 3/8	4 x 1/2	1 3/4 x 3/4	6 x 1
3 x 3/8	6 x 1/2	2 x 3/4	8 x 1
4 x 3/8	1 1/4 x 5/8	4 x 3/4	1 1/2 x 1 1/4
6 x 3/8	1 1/2 x 5/8	1 3/4 x 1	2 x 1 1/4
3/4 x 1/2	2 x 5/8	2 x 1	2 1/2 x 1 1/4
1 x 1/2	2 1/2 x 5/8	2 1/2 x 1	3 x 1 1/4
1 1/2 x 1/2	3 x 5/8	3 x 1	4 x 1 1/4
2 x 1/2	1 x 3/4	3 1/2 x 1	7 x 1 1/4
2 1/2 x 1/2	1 1/4 x 3/4	4 x 1	8 x 1 1/4

AIRKOOL-S DIE STEEL—*Continued*

FLATS—*Continued*

2 x 1½	10 x 1½	4 x 2	3½ x 3
2½ x 1½	3 x 1¾	7 x 2	6 x 3
3 x 1½	4½ x 1¾	8 x 2	7 x 3
3½ x 1½	5 x 1¾	10 x 2	8 x 3
4 x 1½	6 x 1¾	3 x 2½	10 x 3
5 x 1½	2½ x 2	3½ x 2½	4 x 3½
6 x 1½	3 x 2	4½ x 2½	8 x 4
8 x 1½			

SQUARES

½	¾	1	1½	3
⅝	⅞	1¼	2½	4

HOT WORK STEELS

Index

HOT WORK STEELS

Index

HOT WORK STEELS

In its constant efforts to anticipate the needs of industry, the Crucible Steel Company of America early recognized the continual improvements being made in the methods of hot forming and shaping metals. New forging machines with greater power and speed were introduced to increase production. This increase in available power permitted the successful forging, shaping, and heading of higher carbon and alloy steels at lower temperatures. As such changes took place, Crucible was ready with a hot work steel to meet these requirements. Many times red hardness became less desirable than extreme toughness. Other times, resistance to abrasive wear was preferred to either toughness or red hardness. The applications of hot work steel are so diversified that no one or two types are suitable for all requirements. Crucible therefore has developed and now stocks several hot work steels, each best suited for a particular type of service.

NU-DIE HOT WORK STEEL BARS

Carbon 0.40% **Silicon 1.00%** **Chromium 5.00%**
Molybdenum 1.35% **Vanadium 0.35%**

Annealed

Nu-Die is a tough hot work steel suitable for tools requiring a higher degree of toughness at room temperatures (and at moderate elevated temperatures) than obtainable with the tungsten types of hot work steels. It is particularly suitable for all hot work operations on which drastic coolants are used. Nu-Die is very resistant to heat checking when water cooled in operation.

Hot Rolled

ROUNDS

3/4	2 1/4	3 1/2	5 1/4	6 1/2
1	2 3/8	3 3/4	5 1/2	6 3/4
1 1/4	2 1/2	4	5 3/4	7
1 1/2	2 3/4	4 1/2	6	8
1 3/4	3	4 3/4	6 1/4	9
2	3 1/4	5		

SQUARES

1 1/16	1 3/16	1 5/8	2	4
1 1/8	1 3/8	1 7/8	2 1/4	

HEXAGONS

13/16	1	1 5/16	1 7/8	2 3/8
7/8	1 1/16	1 1/2	2 1/8	2 1/2
15/16	1 3/16	1 11/16		

PEERLESS A HOT WORK STEEL BARS

Carbon 0.28% **Chromium 3.25%** **Tungsten 9.00%** **Vanadium 0.25%**

Annealed

Peerless A is a low carbon, medium tungsten, hot work steel which possesses excellent red hardness properties. This steel is successfully used in those applications where the tool operates at a dull red heat and has red hardness properties similar to those of high speed steel but of a lower order. It works best in those cases where the tool varies in temperature between 600F and 1100F. Usually tempered between 1100F and 1250F, Peerless A maintains the hardness developed by tempering during normal service. This grade is particularly adaptable for such applications as gripper dies, punches and forging insert dies.

ROUNDS

1/2	1	1 5/8	2 1/4	3 1/4
9/16	1 1/8	1 11/16	2 3/8	3 1/2
5/8	1 1/4	1 3/4	2 1/2	3 3/4
11/16	1 5/16	1 13/16	2 5/8	4
3/4	1 3/8	1 7/8	2 3/4	4 1/2
13/16	1 7/16	2	2 7/8	5
7/8	1 1/2	2 1/8	3	6
15/16	1 9/16			

FLATS

2 1/8 x 1 1/4	2 1/2 x 2	2 3/4 x 2 1/4	3 1/2 x 2 1/4

SQUARES

2	3	3 1/2	4	6 (Billets)

ATHA PNEU TOOL STEEL BARS

Carbon 0.50% Chromium 1.25% Tungsten 2.75% Vanadium 0.20%

Atha Pneu has been used with great success for many applications involving severe pounding at a fairly low temperature and is truly a shock resisting steel. Its transverse strength under rapid shock is excellent. It does not possess the very high resistance to heat checking found in tungsten hot work steels. This steel also has been used with great success for shear blades and various types of header and swaging dies.

Annealed

ROUNDS

1/4	3/4	1 1/2	2 5/8	4
3/8	7/8	1 5/8	2 3/4	4 1/2
7/16	1	1 3/4	3	5
1/2	1 1/8	2	3 1/4	6
9/16	1 1/4	2 1/4	3 1/2	6 1/4
5/8	1 3/8	2 1/2		

FLATS

1 x 1/4	4 x 1 1/4	5 1/4 x 1 3/4	4 x 2
3 x 1/4	5 x 1 1/4	3 x 2	5 x 2
2 x 1/2	2 x 1 1/2	3 1/2 x 2	5 x 4
3 1/2 x 1 1/4	5 x 1 1/2		

SQUARES

1	2	2 3/4	3	4

OCTAGONS

3/8	5/8	7/8	1 1/8
1/2	3/4	1	1 1/4

CHRO-MOW HOT WORK STEEL BARS

Carbon 0.30% **Silicon 1.00%** **Chromium 5.00%**
Molybdenum 1.35% **Tungsten 1.25%** **Vanadium 0.25%**

Annealed

Chro-Mow is a good tough hot work steel and will harden from a relatively low temperature in air. Chro-Mow possesses excellent resistance to heat checking. As it has a slight secondary hardness when tempered at 1000F, it is resistant to softening at temperatures below 1000F.

ROUNDS

¾	2⅜	3⅝	4 13/16	6¾
⅞	2½	3¾	5	7
1	2⅝	4	5¼	7½
1¼	2¾	4⅛	5½	8
1½	3	4¼	6	8½
1¾	3⅛	4⅜	6¼	9
2	3¼	4½	6½	12½
2¼	3½	4¾		

SQUARES

3	4¼	8 (Billets)
4	4¾	10 (Billets)
4 (Billets)	5¼	12 (Billets)
4⅛	6 (Billets)	14 (Billets)

FLATS

3 x 1⅝	5½ x 4¼	6½ x 4⅝	7 x 5
4 x 2	6½ x 4½	6½ x 4¾	

CHRO-MOW FORGINGS ANNEALED AND SAND BLASTED

All Sizes to Finish

4 x ¾	6 x 2¾	7 x 2½	10 x 1¼
6 x ¾	6 x 3¼	7⅜ x 1	10 x 3
6 x 1	6½ x 1	8 x 1	12 x 3
6 x 1¼	6½ x 2½	8 x 3½	13 x 3
6 x 1½	7 x 1	9 x 2¾	15 x 3

CHRO-MOW FORGINGS ANNEALED AND SAND BLASTED—*Continued*

4 x 1	8¾ x 2	10 x 5	13 x 2¼
4¾ x 2⅜	8.842 x 1.188	10 x 5⅝	13 x 2½
6 x 2½	8.842 x 2.437	10⅜ x 4	13 x 3
6 x 4	9½ x 4½	10⅜ x 4 7/16	13 x 4
6½ x 3	10 x 1	10⅜ x 5 7/16	13 x 5
7 x 3¼	10 x 1⅜	10⅜ x 6⅜	13¾ x 1⅜
8 x 2	10 x 2	10⅜ x 7¾	13¾ x 2¼
8 x 2⅝	10 x 2¼	11 1/16 x 4⅝	13¾ x 5⅝
8 x 3	10 x 2⅝	12 15/16 x 4⅝	17 15/16 x 7
8½ x 2	10 x 4	13 x 2	

CHRO-MOW HOT WORK ELECTRODES

Chro-Mow Hot Work Electrodes are used to weld many types of hot work steels. They are recommended for welding damaged or worn hot working punches, headers, trimmers, etc., used in hot working of metals and plastics. They may also be used for composite fabrication of units requiring hot work steel using nickel-chromium steel base.

Properties of Weld Metals—Excellent hot work air hardening characteristics-abrasive resistant and exceptionally tough. Deposits withstand alternate heating and cooling. "As-welded" hardness is approximately 52-55 Rockwell C., can be annealed or reheat-treated, drawn or tempered.

Heat Treatment—Anneal 1500-1600 F. Harden 1750-1850 F. Quench in oil. Harden 1800-1900 F. Quench in air. Temper 900-1200 F. Cool in still air. See Chro-Mow data sheet.

Procedure—For composite dies preheat to 500 F. To repair existing die units, preheat to 900 F and do not drop below 700 F during welding.

Postheating or Tempering—Temper to desired hardness or toughness to withstand condition to which unit will be subjected.

ROUNDS

3/32	1/8	5/32

Approximate Current Setting. 3/32—60-90; 1/8—75-125; 5/32—100-150.
Identification—End color—green.

HALCOMB 218 HOT WORK STEEL BARS

Carbon 0.40% **Silicon 1.00%** **Chromium 5.00%**
Molybdenum 1.35% **Vanadium 0.35%**

Annealed

Halcomb 218 is a tough hot work steel suitable for tools requiring a higher degree of toughness at room temperatures (and at modern elevated temperatures) than obtainable with the tungsten types of hot work steels. It is particularly suitable for all hot work operations on which drastic coolants are used. Halcomb 218 is very resistant to heat checking when water cooled in operation.

ROUNDS

3/4	2 1/4	3 1/2	5 1/4	6 1/2
1	2 3/8	3 3/4	5 1/2	6 3/4
1 1/4	2 1/2	4	5 3/4	7
1 1/2	2 3/4	4 1/2	6	8
1 3/4	3	4 3/4	6 1/4	9
2	3 1/4	5		

SQUARES

1 1/16	1 3/16	1 5/8	2	4
1 1/8	1 3/8	1 7/8	2 1/4	

HEXAGONS

13/16	1	1 5/16	1 7/8	2 3/8
7/8	1 1/16	1 1/2	2 1/8	2 1/2
15/16	1 3/16	1 11/16		

HALVAN TOOL STEEL

Carbon 0.50% **Manganese 0.80%** **Chromium 1.00%**
Vanadium 0.20%

Halvan Tool Steel is a tough alloy steel and is used for tools requiring resistance to shock and vibration. It is used for both cold and hot work applications.

Annealed

ROUNDS

1/4	1 1/8	2 1/4	3 1/2	5 1/2
5/16	1 1/4	2 3/8	3 3/4	6
3/8	1 3/8	2 1/2	4	6 1/2
7/16	1 1/2	2 5/8	4 1/8	6 3/4
1/2	1 5/8	2 3/4	4 1/4	7
5/8	1 3/4	2 7/8	4 1/2	9
3/4	1 7/8	3	4 3/4	10
7/8	2	3 1/4	5	12
1	2 1/8			

HALVAN STEEL BARS

Annealed

FLATS

1 x 1/2	2 x 1	6 x 1 1/4	6 x 2
1 1/2 x 1/2	2 1/4 x 1	2 x 1 1/2	8 x 2
2 x 1/2	2 1/2 x 1	2 1/2 x 1 1/2	3 x 2 1/2
2 1/2 x 1/2	3 x 1	3 x 1 1/2	3 1/2 x 2 1/2
1 x 3/4	3 1/2 x 1	3 1/2 x 1 1/2	4 x 2 1/2
1 1/4 x 3/4	4 x 1	4 x 1 1/2	4 1/2 x 2 1/2
1 1/2 x 3/4	5 x 1	4 1/2 x 1 1/2	5 x 2 1/2
2 x 3/4	6 x 1	5 x 1 1/2	6 x 2 1/2
2 1/2 x 3/4	1 1/2 x 1 1/4	6 x 1 1/2	4 x 3
3 x 3/4	2 x 1 1/4	2 1/2 x 2	5 x 3
8 x 3/4	2 1/2 x 1 1/4	3 x 2	6 x 3
1 1/4 x 7/8	3 x 1 1/4	3 1/2 x 2	8 x 3
1 1/4 x 1	3 1/2 x 1 1/4	4 x 2	6 x 3 1/2
1 1/2 x 1	4 x 1 1/4	5 x 2	6 x 4
1 3/4 x 1	5 x 1 1/4		

SQUARES

3/4	1 3/4	2 3/4	4 1/2	8
1	2	3	5	8 (Billets)
1 1/4	2 1/4	3 1/2	6	10
1 1/2	2 1/2	4	6 (Billets)	

NU-DIE V DIE CASTING DIE STEEL BARS

Carbon 0.40% **Silicon 1.00%** **Chromium 5.00%**
Molybdenum 1.35% **Vanadium 1.10%**

Annealed

Nu-Die V is an outstanding die casting die steel, particularly for aluminum and magnesium dies. It is also economical to use Nu-Die V for long run zinc dies or die inserts.

The air hardening characteristics of Nu-Die V permit safe hardening with a minimum amount of distortion. In the annealed condition it can be readily machined and takes an excellent polish. Nu-Die V may be nitrided. A high core strength obtained after heat treatment is important for withstanding high casting pressures. Its exceptional resistance to heat checking and to the erosive action of molten aluminum alloys and magnesium alloys insures long service.

ROUNDS

1/2	1 5/8	2 3/4	4 1/4	6 1/4
5/8	1 3/4	3	4 1/2	6 1/2
3/4	1 7/8	3 1/8	4 3/4	6 3/4
7/8	2	3 1/4	5	7
1	2 3/16	3 1/2	5 1/8	7 1/4
1 1/8	2 1/4	3 5/8	5 1/4	8
1 1/4	2 3/8	3 3/4	5 1/2	8 1/2
1 3/8	2 1/2	4	5 3/4	9
1 7/16	2 5/8	4 1/8	6	10
1 1/2				

FLATS

1 1/8 x 3/8	8 x 1	18 x 1 1/2	12 x 2
1 x 3/4	6 x 1 1/4	3 x 1 3/4	16 x 2
1 1/2 x 3/4	12 x 1 1/4	4 1/4 x 1 3/4	6 3/16 x 2 3/16
2 x 3/4	2 1/4 x 1 3/8	4 1/2 x 1 3/4	4 1/4 x 2 1/4
3 x 3/4	2 x 1 1/2	5 1/4 x 1 3/4	4 1/2 x 2 1/4
4 x 3/4	3 x 1 1/2	3 x 2	5 x 2 1/4
5 x 3/4	3 1/4 x 1 1/2	4 x 2	5 1/4 x 2 1/4
6 x 3/4	3 1/2 x 1 1/2	4 1/4 x 2	3 x 2 1/2
1 1/2 x 1	4 x 1 1/2	4 1/2 x 2	4 x 2 1/2
2 x 1	5 x 1 1/2	5 x 2	4 1/4 x 2 1/2
3 x 1	6 x 1 1/2	5 1/4 x 2	5 x 2 1/2
4 x 1	7 x 1 1/2	6 x 2	6 x 2 1/2
5 x 1	8 x 1 1/2	7 x 2	7 x 2 1/2
6 x 1	12 x 1 1/2	8 x 2	8 x 2 1/2
7 x 1	14 x 1 1/2	10 x 2	10 x 2 1/2

NU-DIE V DIE CASTING DIE STEEL BARS*—*Continued*

FLATS—*Continued*

12 x 2½	4 x 3½	13 x 4	12 x 5½
14 x 2½	5 x 3½	20 x 4	14 x 5½
16 x 2½	6 x 3½	20 x 4¼	16 x 5½
18 x 2½	7 x 3½	12 x 4½	18 x 5½
3 x 2¾	10 x 3½	14 x 4½	20 x 5½
3¼ x 3	12 x 3½	16 x 4½	12 x 6
4 x 3	12½ x 3½	18 x 4½	14 x 6
4¼ x 3	14 x 3½	20 x 4½	16 x 6
5 x 3	16 x 3½	6 x 5	18 x 6
6 x 3	18 x 3½	7 x 5	20 x 6
7 x 3	5 x 4	8 x 5	25 x 6
8 x 3	6 x 4	10 x 5	18 x 6½
10 x 3	7 x 4	12 x 5	16 x 7
12 x 3	8 x 4	14 x 5	18 x 7
14 x 3	10 x 4	16 x 5	20 x 7
16 x 3	12 x 4	18 x 5	18 x 8
18 x 3	14 x 4	20 x 5	20 x 8
3⅝ x 3¼	16 x 4		

*All flat bars supplied to finish to size shown.

SQUARES*

½	2	5	10 (Billets)
1	2¼	6 (Billets)	10
1¼	2½	6	12 (Billets)
1½	3	8 (Billets)	12
1¾	4	8	14 (Billets)

* All squares supplied to finish to size shown.

NU-DIE V HOLLOW TOOL STEEL BARS

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2¼ O.D. x 1 I.D.	4½ O.D. x 2 I.D.	5½ O.D. x 2½ I.D.
2½ " x 1¼ "	4½ " x 2½ "	5½ " x 3 "
3 " x 1½ "	4¾ " x 1¾ "	6 " x 2¼ "
3¼ " x 1½ "	5 " x 1½ "	6 " x 3 "
4 " x 1¾ "	5 " x 2 "	6¼ " x 3 9/16 "
4 " x 2¼ "	5 " x 2½ "	6¾ " x 3⅝ "
4¼ " x 2 "	5 " x 3 "	7¼ " x 3¾ "
4¼ " x 2⅜ "	5½ " x 2 "	

CRUSCA 12-B TOOL STEEL BARS

Carbon 0.10% **Manganese 0.50%** **Nickel 3.50%**
Chromium 1.60%

Annealed

ROUNDS

1⅜	2¾	4	5¾	7½
1½	3	4½	6	8
1¾	3¼	4¾	6¼	
2	3½	5	6½	
2¼	3¾	5½	7	

SQUARE BILLETS

4	6	8	10	14

CSM-2 TOOL STEEL BARS

Carbon 0.30% **Manganese 0.75%** **Silicon 0.50%**
Chromium 0.80% **Molybdenum 0.25%**

Annealed

CSM 2 is an electric furnace tool steel made to meet the exacting requirements for zinc base die casting dies as well as plastic mold dies.

ROUNDS

Heat Treated to Brinell 187-228

½	*1¾	*2¾	*4½	7½
¾	1⅞	*3	*5	*8
*1	*2	*3¼	*5½	*9
*1¼	2⅛	*3½	*6	10
1⅜	*2¼	3¾	*6½	11
*1½	*2½	*4	*7	12
*1⅝	2⅝			

* Indicated sizes available in Brinell 197-228 or Brinell 290-320.

CSM-2 TOOL STEEL BARS—*Continued*

ALL FLAT BARS SUPPLIED TO FINISH TO SIZE SHOWN

FLATS

Heat Treated to Brinell 197-228 or Brinell 290-320

12 x 5/8	7 x 2	10 x 3½	16 x 6
18 x 5/8	8 x 2	12 x 3½	17½ x 6
1 x ¾	10 x 2	14 x 3½	18 x 6
1½ x ¾	12 x 2	16 x 3½	20 x 6
2 x ¾	14 x 2	5 x 4	23 x 6
3 x ¾	16 x 2	6 x 4	25 x 6
4 x ¾	20 x 2	7 x 4	30 x 6
5 x ¾	6 3/16 x 2 3/16	8 x 4	36 x 6
6 x ¾	12 x 2¼	10 x 4	40 x 6
8 x ¾	14 x 2¼	12 x 4	16 x 7
10 x ¾	22 x 2¼	14 x 4	18 x 7
1½ x 1	3 x 2½	16 x 4	20 x 7
2 x 1	4 x 2½	16¼ x 4	12 x 8
3 x 1	5 x 2½	18 x 4	16 x 8
4 x 1	6 x 2½	20 x 4	18 x 8
5 x 1	7 x 2½	24 x 4	20 x 8
6 x 1	8 x 2½	25 x 4	25 x 8
7 x 1	10 x 2½	30 x 4	30 x 8
8 x 1	12 x 2½	36 x 4	36 x 8
12 x 1	14 x 2½	40 x 4	40 x 8
18 x 1	16 x 2½	16 x 4¼	20 x 9
6 x 1¼	12 x 2¾	10 x 4½	25 x 9
8 x 1¼	14 x 2¾	14 x 4½	20 x 10
10 x 1¼	4 x 3	16 x 4½	22 x 10
12 x 1¼	5 x 3	18 x 4½	24 x 10
2 x 1½	6 x 3	20 x 4½	25 x 10
3 x 1½	7 x 3	22 x 4½	30 x 10
4 x 1½	8 x 3	6 x 5	40 x 10
5 x 1½	10 x 3	7 x 5	20 x 11
6 x 1½	12 x 3	12 x 5	25 x 11
7 x 1½	14 x 3	14 x 5	20 x 12
8 x 1½	16 x 3	16 x 5	24 x 12
10 x 1½	18 x 3	18 x 5	25 x 12
12 x 1½	20 x 3	20 x 5	30 x 12
18 x 1½	4 x 3½	22 x 5	40 x 12
20 x 1½	5 x 3½	23 x 5	20 x 15
3 x 2	5½ x 3½	24 x 5	25 x 15
4 x 2	6 x 3½	25 x 5	
5 x 2	7 x 3½	16 x 5½	
6 x 2	8 x 3½	12 x 6	

CSM-2 TOOL STEEL BARS—*Continued*

ALL SQUARE BARS SUPPLIED TO FINISH TO SIZE SHOWN

Heat Treated to Brinell 290-320

SQUARES

1 1½	2 2 1/16	2½ 3	4* 5	6* 8

* These sizes available Brinell 197-228 or Brinell 290-320.

Annealed

SQUARE BILLETS

4	6	8	10	12

LA BELLE HT TOOL STEEL

Carbon 0.43% **Manganese 1.35%** **Silicon 2.25%**
Chromium 1.35% **Vanadium 0.30%** **Molybdenum 0.40%**

LaBelle HT is a deep hardening alloy tool steel designed to have excellent toughness properties at relatively high hardness levels. This steel performs well in applications where shock and impact are major factors such as for heavy duty shearing, punching and cold striking dies.

Annealed

ROUNDS

¼ ⅜ ½	⅝ ¾ 1	1⅛ 1¼ 1½	1¾ 2 2½	3 3½ 4

FLATS

1 x ⅜	1 x ¾	1¾ x 1	3 x 1¼
1½ x ⅜	1½ x ¾	2¼ x 1	3½ x 1¼
1 x ½	2 x ¾	2¾ x 1	4 x 1¼
1½ x ½	2½ x ¾	3¼ x 1	4½ x 1¼
1¼ x ⅝	3 x ¾	3¾ x 1	5 x 1¼
1¾ x ⅝	4 x ¾	4½ x 1	5½ x 1¼

SQUARES

½	⅝	¾	1	1¼	1½

OIL HARDENING TOOL STEELS

Index

OIL HARDENING TOOL STEELS

Index

KETOS OIL HARDENING TOOL STEEL BARS

Carbon 0.90% **Manganese 1.30%** **Chromium 0.50%**
Tungsten 0.50%

Annealed

The increased and continued use of Ketos Oil Hardening Tool Steel by both large and small users has demonstrated its superiority and firmly intrenched it as the standard in the field of oil hardening non-deforming tool steels. This steel may be hardened at fairly low temperatures with minimum volume change. Ketos has deep hardening qualities together with a fine grain structure affording a large production at a single grind and permitting a great many grinds before the tool is worn out.

ROUNDS

1/4	1 1/8	2 1/2	4 1/4	6 3/4
5/16	1 3/16	2 5/8	4 3/8	7
3/8	1 1/4	2 3/4	4 1/2	7 1/4
7/16	1 5/16	2 7/8	4 5/8	7 1/2
1/2	1 3/8	3	4 3/4	8
9/16	1 7/16	3 1/8	5	8 1/2
5/8	1 1/2	3 1/4	5 1/8	9
11/16	1 5/8	3 3/8	5 1/4	9 1/2
3/4	1 3/4	3 1/2	5 1/2	10
13/16	1 7/8	3 5/8	5 3/4	11
7/8	2	3 3/4	6	12
15/16	2 1/8	3 7/8	6 1/4	14 1/8
1	2 1/4	4	6 1/2	15 1/8
1 1/16	2 3/8	4 1/8		

FLATS

2 x 1/16	3 x 1/8	2 x 3/16	1 1/4 x 1/4
1/2 x 1/8	4 x 1/8	2 1/2 x 3/16	1 1/2 x 1/4
5/8 x 1/8	3/8 x 3/16	3 x 3/16	1 3/4 x 1/4
3/4 x 1/8	1/2 x 3/16	3/8 x 1/4	2 x 1/4
1 x 1/8	3/4 x 3/16	1/2 x 1/4	2 1/4 x 1/4
1 1/8 x 1/8	7/8 x 3/16	5/8 x 1/4	2 1/2 x 1/4
1 1/4 x 1/8	1 x 3/16	3/4 x 1/4	3 x 1/4
1 1/2 x 1/8	1 1/4 x 3/16	7/8 x 1/4	3 1/2 x 1/4
2 x 1/8	1 1/2 x 3/16	1 x 1 1/4	4 x 1/4
2 1/2 x 1/8	1 3/4 x 3/16	1 1/8 x 1/4	5 x 1/4

KETOS OIL HARDENING TOOL STEEL BARS
— *Continued*

FLATS — *Continued*

6 x 1/4	2 1/4 x 1/2	2 x 3/4	5 x 1
13/16 x 9/32	2 1/2 x 1/2	2 1/4 x 3/4	5 1/2 x 1
1/2 x 5/16	2 3/4 x 1/2	2 1/2 x 3/4	6 x 1
5/8 x 5/16	3 x 1/2	2 3/4 x 3/4	7 x 1
3/4 x 5/16	3 1/2 x 1/2	3 x 3/4	8 x 1
1 x 5/16	4 x 1/2	3 1/2 x 3/4	9 x 1
1 1/4 x 5/16	4 1/2 x 1/2	3 3/4 x 3/4	10 x 1
1 1/2 x 5/16	5 x 1/2	4 x 3/4	12 x 1
1 3/4 x 5/16	6 x 1/2	4 1/2 x 3/4	2 x 1 1/8
2 x 5/16	7 x 1/2	5 x 3/4	3 x 1 1/8
2 1/2 x 5/16	8 x 1/2	6 x 3/4	4 x 1 1/8
3 x 5/16	9 x 1/2	7 x 3/4	6 x 1 1/8
4 x 5/16	10 x 1/2	8 x 3/4	1 1/2 x 1 1/4
6 x 5/16	12 x 1/2	10 x 3/4	1 3/4 x 1 1/4
1/2 x 3/8	3/4 x 5/8	12 x 3/4	2 x 1 1/4
5/8 x 3/8	7/8 x 5/8	1 x 7/8	2 1/4 x 1 1/4
3/4 x 3/8	1 x 5/8	1 1/8 x 7/8	2 1/2 x 1 1/4
7/8 x 3/8	1 1/8 x 5/8	1 1/4 x 7/8	2 3/4 x 1 1/4
1 x 3/8	1 1/4 x 5/8	1 1/2 x 7/8	3 x 1 1/4
1 1/4 x 3/8	1 1/2 x 5/8	1 3/4 x 7/8	3 1/2 x 1 1/4
1 1/2 x 3/8	1 3/4 x 5/8	2 x 7/8	4 x 1 1/4
1 3/4 x 3/8	2 x 5/8	2 1/2 x 7/8	4 1/2 x 1 1/4
2 x 3/8	2 1/4 x 5/8	3 x 7/8	5 x 1 1/4
2 1/4 x 3/8	2 1/2 x 5/8	3 1/2 x 7/8	5 1/2 x 1 1/4
2 1/2 x 3/8	2 3/4 x 5/8	4 x 7/8	6 x 1 1/4
3 x 3/8	3 x 5/8	5 x 7/8	6 1/2 x 1 1/4
3 1/2 x 3/8	3 1/4 x 5/8	6 x 7/8	7 x 1 1/4
4 x 3/8	3 1/2 x 5/8	1 1/4 x 1	8 x 1 1/4
4 1/2 x 3/8	4 x 5/8	1 1/2 x 1	9 x 1 1/4
5 x 3/8	4 1/2 x 5/8	1 3/4 x 1	10 x 1 1/4
6 x 3/8	5 x 5/8	2 x 1	12 x 1 1/4
5/8 x 1/2	6 x 5/8	2 1/4 x 1	1 3/4 x 1 1/2
3/4 x 1/2	8 x 5/8	2 1/2 x 1	2 x 1 1/2
7/8 x 1/2	10 x 5/8	2 3/4 x 1	2 1/4 x 1 1/2
1 x 1/2	7/8 x 3/4	3 x 1	2 1/2 x 1 1/2
1 1/8 x 1/2	1 x 3/4	3 1/4 x 1	2 3/4 x 1 1/2
1 1/4 x 1/2	1 1/8 x 3/4	3 1/2 x 1	3 x 1 1/2
1 1/2 x 1/2	1 1/4 x 3/4	4 x 1	3 1/4 x 1 1/2
1 3/4 x 1/2	1 1/2 x 3/4	4 1/4 x 1	3 1/2 x 1 1/2
2 x 1/2	1 3/4 x 3/4	4 1/2 x 1	4 x 1 1/2

KETOS OIL HARDENING TOOL STEEL BARS
—*Continued*

FLATS—*Continued*

4½ x 1½	7 x 1¾	4 x 2¼	7 x 3
5 x 1½	2¼ x 2	3 x 2½	8 x 3
5½ x 1½	2½ x 2	3½ x 2½	10 x 3
6 x 1½	2¾ x 2	4 x 2½	12 x 3
7 x 1½	3 x 2	4½ x 2½	4 x 3½
8 x 1½	3½ x 2	5 x 2½	4½ x 3½
9 x 1½	4 x 2	5½ x 2½	5 x 3½
10 x 1½	4½ x 2	6 x 2½	6 x 3½
12 x 1½	5 x 2	7 x 2½	7 x 3½
2 x 1¾	5½ x 2	8 x 2½	12 x 3½
2¼ x 1¾	6 x 2	10 x 2½	5 x 4
2½ x 1¾	7 x 2	12 x 2½	6 x 4
2¾ x 1¾	7½ x 2	3½ x 3	7 x 4
3 x 1¾	8 x 2	4 x 3	8 x 4
3½ x 1¾	9 x 2	4½ x 3	10 x 4
4 x 1¾	10 x 2	5 x 3	5 x 4½
4½ x 1¾	12 x 2	5½ x 3	6 x 5
5 x 1¾	3 x 2¼	6 x 3	8 x 5
6 x 1¾			

SQUARES

¼	⅝	1¼	2¼	4
5/16	¾	1⅜	2½	4½
⅜	⅞	1½	2¾	5
7/16	1	1¾	3	6
½	1⅛	2	3½	8

SQUARE BILLETS

4	6	8	10	12

KETOS HOLLOW TOOL STEEL BARS

Annealed and Machined

2	O.D.	x	1	I.D.	6	O.D.	x	2	I.D.	10	O.D. x 6 I.D.
2¼	"	x	1	"	6	"	x	3	"	11	" x 4 "
2½	"	x	1	"	6½	"	x	3½	"	11	" x 6 "
2½	"	x	1½	"	7	"	x	1½	"	11	" x 7 "
3	"	x	1	"	7	"	x	3	"	12	" x 5 "
3	"	x	1½	"	7	"	x	4	"	12	" x 6 "
3¼	"	x	1¼	"	7½	"	x	3	"	12	" x 7 "
3¼	"	x	1½	"	7½	"	x	3½	"	12	" x 8 "
3½	"	x	2	"	8	"	x	2¾	"	13	" x 6 "
4	"	x	1½	"	8	"	x	3½	"	13	" x 7 "
4	"	x	2	"	8	"	x	5	"	13	" x 9 "
4½	"	x	2	"	8½	"	x	5¼	"	14	" x 7 "
5	"	x	1½	"	9	"	x	4	"	14	" x 10 "
5	"	x	2	"	9	"	x	5	"	15	" x 9 "
5	"	x	2½	"	9	"	x	6	"	15	" x 10 "
5	"	x	3	"	10	"	x	4	"	16	" x 10 "
5½	"	x	2	"	10	"	x	5	"	16	" x 12 "
6	"	x	1½	"							

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

KETOS OIL HARDENING TOOL STEEL SHEETS

Annealed

SHEETS
18 x ⅛ x 72

KETOS OIL HARDENING ELECTRODES

Ketos Oil Hardening Electrodes are designed for welding the non-shrink and manganese tool steels. Tool steels of these types are known for their toughness and shock-resisting qualities. Recommended for repairing existing die units of the oil hardening class, and may be used for composite fabrication of units requiring oil hardening steel. Typical applications: cold blanking, trimming and forming dies, cold cutting and shearing, and where shrinking and deforming during treatment must be held to a minimum.

KETOS OIL HARDENING ELECTRODES—*Continued*

Properties of Weld Metal: "As-welded" hardness is approximately 58-60 Rockwell C., may be annealed and reheat-treated, drawn or tempered to any degree of hardness or toughness.

Heat Treatment—Anneal 1425-1450 F. Harden 1425-1475 F. Quench in oil. Temper 250-400 F. See Ketos data sheet.

Preheating—250/350 F.

Postheating or Tempering—Temper to desired hardness or toughness to withstand conditions to which unit will be subjected.

ROUNDS

3/32	1/8	5/32

Approximate Current Settings: 3/32—60-90; 1/8—75-125; 5/32—100-150.
Identification—End color—blue.

LA BELLE SILICON #2 TOOL STEEL BARS

Carbon 0.60% **Manganese 0.75%** **Silicon 1.90%**
Chromium 0.25% **Molybdenum 0.30%**

The outstanding characteristic of La Belle Silicon #2 is its toughness at relatively high hardness. When properly quenched and tempered to Rockwell C 57 to 59, it resists impact and battering, yet maintains a good cutting edge. It can be hardened either in oil or water. Simple shapes and larger sections are usually water quenched and more complicated shapes and smaller sections may be oil quenched. It is particularly adaptable for such applications as concrete breakers, hammers, punches, shear blades and pneumatic chisels.

Annealed and Centerless Ground

ROUNDS

1/2 5/8	3/4 7/8	1 1 1/8	1 1/4	1 1/2

Annealed Bars

ROUNDS

1/4 5/16 3/8 7/16	1/2 9/16 5/8 3/4	13/16 7/8 15/16 1	1 1/8 1 3/16 1 1/4 1 3/8	1 7/16 1 1/2 1 5/8 1 3/4

LA BELLE SILICON #2 TOOL STEEL BARS — *Continued*

Annealed Bars — Continued

ROUNDS — *Continued*

1 7/8	2 1/2	3 1/2	4 1/2	6
2	2 3/4	3 3/4	5	6 1/2
2 1/8	3	4	5 1/2	8
2 1/4	3 1/4	4 1/4		

Annealed

SQUARES

5/16	1/2	1	1 3/8	2 1/2
3/8	5/8	1 1/8	1 1/2	3
7/16	3/4	1 1/4	2	

Natural

OCTAGONS

5/8	3/4	7/8

Annealed

OCTAGONS

3/8	5/8	13/16	1	1 1/4
1/2	3/4	7/8	1 1/8	

ATHA PNEU TOOL STEEL

Carbon 0.50% **Chromium 1.25%** **Tungsten 2.75%**
Vanadium 0.20%

Atha Pneu is an alloy tool steel designed for applications requiring extreme toughness combined with good wear resistance and cutting properties. It has very high resistance to fatigue and gives excellent results in applications where shock and impact are major factors. Atha Pneu may be applied on either hot working or cold working requirements. It gives excellent performance in hot working tools where the requirements are hardness and toughness and where high red hardness is not essential. Atha Pneu, when carburized, has found wide and successful application for draw punches and dies where high wear resistance combined with great core strength is required.

Annealed

ROUNDS

1/4	3/4	1 1/2	2 5/8	4
3/8	7/8	1 5/8	2 3/4	4 1/2
7/16	1	1 3/4	3	5
1/2	1 1/8	2	3 1/4	6
9/16	1 1/4	2 1/4	3 1/2	6 1/4
5/8	1 3/8	2 1/2		

FLATS

1 x 1/4	4 x 1 1/4	5 1/4 x 1 3/4	4 x 2
3 x 1/4	5 x 1 1/4	3 x 2	5 x 2
2 x 1/2	2 x 1 1/2	3 1/2 x 2	5 x 4
3 1/2 x 1 1/4	5 x 1 1/2		

SQUARES

1	2	2 3/4	3	4

OCTAGONS

3/8	5/8	7/8	1 1/8
1/2	3/4	1	1 1/4

LA BELLE 2–70

Carbon 0.60% **Silicon 1.90%** **Manganese 0.75%**
Chromium 0.25%

This steel is a tough alloy tool steel with good resistance to battering and shock at relatively high hardness. It may be quenched in water or oil. Simple shapes and larger sections are usually water quenched and more complicated shapes and smaller sections may be oil quenched.

Annealed Bars

ROUNDS

3/8	5/8

OCTAGONS

3/4	7/8	1	1 1/8	1 1/4

HEXAGONS

1/2	5/8	3/4	1

HALVAN TOOL STEEL

Carbon 0.50% **Manganese 0.80%** **Chromium 1.00%**
Vanadium 0.20%

Halvan Tool Steel is a tough alloy steel and is used for tools requiring resistance to shock and vibration. It is used for both cold and mild hot work applications.

Annealed

ROUNDS

1/4	1 1/8	2 1/4	3 1/2	5 1/2
5/16	1 1/4	2 3/8	3 3/4	6
3/8	1 3/8	2 1/2	4	6 1/2
7/16	1 1/2	2 5/8	4 1/8	6 3/4
1/2	1 5/8	2 3/4	4 1/4	7
5/8	1 3/4	2 7/8	4 1/2	9
3/4	1 7/8	3	4 3/4	10
7/8	2	3 1/4	5	12
1	2 1/8			

HALVAN TOOL STEEL—*Continued*

FLATS

1 x ½	2 x 1	6 x 1¼	6 x 2
1½ x ½	2¼ x 1	2 x 1½	8 x 2
2 x ½	2½ x 1	2½ x 1½	3 x 2½
2½ x ½	3 x 1	3 x 1½	3½ x 2½
1 x ¾	3½ x 1	3½ x 1½	4 x 2½
1¼ x ¾	4 x 1	4 x 1½	4½ x 2½
1½ x ¾	5 x 1	4½ x 1½	5 x 2½
2 x ¾	6 x 1	5 x 1½	6 x 2½
2½ x ¾	1½ x 1¼	6 x 1½	4 x 3
3 x ¾	2 x 1¼	2½ x 2	5 x 3
8 x ¾	2½ x 1¼	3 x 2	6 x 3
1¼ x ⅞	3 x 1¼	3½ x 2	8 x 3
1¼ x 1	3½ x 1¼	4 x 2	6 x 3½
1½ x 1	4 x 1¼	5 x 2	6 x 4
1¾ x 1	5 x 1¼		

SQUARES

¾	2	3½	8
1	2¼	4	10
1¼	2½	4½	6 (Billets)
1½	2¾	5	8 (Billets)
1¾	3	6	

WATER HARDENING TOOL STEELS

Index

WATER HARDENING TOOL STEELS

Index

ALVA EXTRA TOOL STEEL BARS

Carbon 0.95% **Vanadium 0.20%**

Annealed

Alva Extra is a shallow hardening alloy tool steel. Due to its vanadium content, this grade is superior in toughness and resistance to fatigue to carbon tool steels. This makes its use desirable for many types of impact tools.

ROUNDS

3/8	1	1 5/8	2 1/4	3 1/2
1/2	1 1/8	1 3/4	2 1/2	4
5/8	1 1/4	1 7/8	2 3/4	4 1/2
3/4	1 3/8	2	3	5 1/8
7/8	1 1/2	2 1/8	3 1/4	

SQUARES

3/8	1/2	5/8	1	2

OCTAGONS

3/4	7/8

ALVA EXTRA TOOL STEEL BARS

Natural

OCTAGONS

3/8	1/2	5/8	3/4	1

SANDERSON SPECIAL CARBON TOOL STEEL BARS

10½ Temper — 1.10% Carbon

Annealed

Sanderson Special is a superior quality water hardening carbon tool steel with deep hardening characteristics. It is electric furnace melted under very closely controlled melting standards and is maintained consistently within definite limits for hardenability and grain size. This tool steel has a broad hardening range and may be quenched between 1425F and 1500F, with very slight effect on grain coarsening or case depth. Sanderson Special is widely used in applications for cutting tools requiring ability to maintain a keen cutting edge together with excellent wear resistance. The deep hardening characteristics of this steel make it a preferred grade for use on large sections.

ROUNDS

⅜	1	1⅝	2¼	3½
½	1⅛	1¾	2½	4
⅝	1¼	1⅞	2¾	5
¾	1⅜	2	3	6
⅞	1½			

FLATS

2 x ¾	3 x 1	4 x 1½	10 x 2
4 x ¾	4 x 1	6 x 1½	10 x 2½
1½ x 1	2 x 1¼	3 x 2	4 x 3
2 x 1	2 x 1½	4 x 2	6 x 3
2½ x 1	3 x 1½	6 x 2	6 x 4

SANDERSON HOLLOW TOOL STEEL BARS

Annealed and Machined

10 TEMPER

2	O.D.	x	1	I.D.	7½	O.D.	x	3	I.D.	11	O.D. x 6 I.D.
3¼	"	x	1¼	"	7½	"	x	3½	"	12	" x 5 "
3½	"	x	1½	"	8	"	x	3½	"	12	" x 6 "
3½	"	x	2	"	8	"	x	5	"	12	" x 7 "
4½	"	x	2	"	8	"	x	6	"	13	" x 7 "
5	"	x	2	"	8½	"	x	5¼	"	14	" x 7 "
5	"	x	3	"	9	"	x	4	"	15	" x 10 "
5½	"	x	2½	"	9	"	x	6	"	15	" x 11 "
6	"	x	3	"	10	"	x	5	"	16	" x 10 "
7	"	x	3	"	10	"	x	6	"	16	" x 12 "
7	"	x	4	"	11	"	x	4	"		

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

CRESCENT SPECIAL CARBON TOOL STEEL BARS

10 Temper — 1.05% Carbon

Annealed

Crescent Special is one of the highest quality water hardening carbon tool steels and may be classified as having medium deep hardening characteristics. It is electric furnace melted and is produced under rigid melting and processing standards to insure consistent uniformity in grain size and hardenability from heat to heat. Crescent Special may be hardened from a fairly broad temperature range without undue effect on case depth or grain size. The medium deep hardening characteristics provide a strong, tough core making this grade particularly adaptable for tools requiring extreme resistance to shock as well as wear resistance.

ROUNDS

3/8	7/8	1 3/8	2 1/4	3 1/2
7/16	15/16	1 1/2	2 3/8	3 3/4
1/2	1	1 5/8	2 1/2	4
9/16	1 1/16	1 3/4	2 5/8	4 1/2
5/8	1 1/8	1 7/8	2 3/4	5
11/16	1 1/4	2	3	6
3/4	1 5/16	2 1/8	3 1/4	

FLATS

1 x 1/2	2 1/2 x 3/4	2 1/2 x 1 1/4	2 1/4 x 2
1 1/4 x 1/2	3 x 3/4	3 x 1 1/4	2 1/2 x 2
2 x 1/2	3 1/2 x 3/4	4 x 1 1/4	3 x 2
1 x 5/8	4 x 3/4	1 3/4 x 1 1/2	3 1/2 x 2
1 1/4 x 5/8	1 1/4 x 1	2 x 1 1/2	5 x 2
1 1/2 x 5/8	1 1/2 x 1	2 1/4 x 1 1/2	3 1/4 x 2 1/4
2 x 5/8	2 x 1	2 1/2 x 1 1/2	3 x 2 1/2
2 1/4 x 5/8	2 1/2 x 1	3 x 1 1/2	3 1/2 x 2 1/2
2 1/2 x 5/8	3 x 1	3 1/2 x 1 1/2	3 1/2 x 3
3 x 5/8	1 1/2 x 1 1/4	2 x 1 3/4	4 x 3 1/2
1 1/4 x 3/4	2 x 1 1/4	2 1/4 x 1 3/4	5 x 3 1/2
1 1/2 x 3/4	2 1/4 x 1 1/4	2 1/2 x 1 3/4	6 x 3 1/2
2 x 3/4			

SQUARES

5/16	7/8	1 1/2	2	3
1/2	1	1 5/8	2 1/4	3 1/2
5/8	1 1/8	1 3/4	2 1/2	4
3/4	1 1/4			

CRESCENT SPECIAL FORGED JEWELERS DIE BLOCKS

5 DEGREE BEVEL ALL SIDES

SQUARES

1	1¾	2½	4	6
1¼	2	3	5	8
1½	2¼	3½		

FLATS

2½ x 1	3½ x 1½	4½ x 2	4 x 3
3 x 1	3 x 1¾	5 x 2	5 x 3
3½ x 1	2½ x 2	6 x 2	6 x 4
3 x 1¼	3 x 2	3 x 2½	7 x 5
2 x 1½	3½ x 2	3½ x 2½	8 x 5
2½ x 1½	4 x 2	5 x 2½	8 x 6
3 x 1½			

CRESCENT SPECIAL MACHINED JEWELERS DIE BLOCKS

1⅞ Face	2 3/16 Face

SANDERSON EXTRA CARBON TOOL STEEL BARS

10 Temper — 0.95% Carbon

Annealed

Sanderson Extra is an electric furnace melted, high quality water hardening carbon tool steel, with medium shallow hardening characteristics. Rigid melting and processing standards are maintained to insure uniform quality and consistent performance at all times. Sanderson Extra may be used in a broad range of applications, making it a preferred general purpose water hardening tool steel. It develops sufficient case depth to insure good service in general purpose cutting tools such as blanking dies, reamers and punches, combined with a strong tough core which provides excellent shock resistance for all types of striking, blanking and forming dies.

ROUNDS

1/4	1	2	3 5/8	5 3/4
5/16	1 1/16	2 1/8	3 3/4	6
3/8	1 1/8	2 1/4	4	6 1/8
7/16	1 1/4	2 3/8	4 1/8	6 1/4
1/2	1 5/16	2 1/2	4 1/4	6 1/2
9/16	1 3/8	2 5/8	4 1/2	7
5/8	1 7/16	2 3/4	4 5/8	7 1/2
11/16	1 1/2	2 7/8	4 3/4	8
3/4	1 9/16	3	5	8 1/4
13/16	1 5/8	3 1/8	5 1/4	8 1/2
7/8	1 3/4	3 1/4	5 1/2	9 1/4
15/16	1 7/8	3 1/2		

FLATS

1/2 x 1/8	1 1/2 x 3/16	6 x 1/4	1 x 3/8
5/8 x 1/8	2 x 3/16	1/2 x 5/16	1 1/8 x 3/8
3/4 x 1/8	2 1/2 x 3/16	5/8 x 5/16	1 1/4 x 3/8
1 x 1/8	3/8 x 1/4	3/4 x 5/16	1 1/2 x 3/8
1 1/4 x 1/8	1/2 x 1/4	7/8 x 5/16	1 3/4 x 3/8
1 1/2 x 1/8	5/8 x 1/4	1 x 5/16	2 x 3/8
2 x 1/8	3/4 x 1/4	1 1/4 x 5/16	2 1/2 x 3/8
3 x 1/8	1 x 1/4	1 1/2 x 5/16	3 x 3/8
3/8 x 3/16	1 1/4 x 1/4	1 3/4 x 5/16	4 x 3/8
1/2 x 3/16	1 1/2 x 1/4	2 x 5/16	6 x 3/8
5/8 x 3/16	2 x 1/4	3 x 5/16	5/8 x 1/2
3/4 x 3/16	2 1/4 x 1/4	1/2 x 3/8	3/4 x 1/2
1 x 3/16	2 1/2 x 1/4	5/8 x 3/8	1 x 1/2
1 1/16 x 3/16	3 x 1/4	3/4 x 3/8	1 1/8 x 1/2
1 1/4 x 3/16	4 x 1/4	7/8 x 3/8	1 1/4 x 1/2

SANDERSON EXTRA CARBON TOOL STEEL BARS—*Continued*

FLATS—*Continued*

1½ x ½	1½ x ¾	2½ x 1	3 x 1½
1¾ x ½	1¾ x ¾	2¾ x 1	3½ x 1½
2 x ½	2 x ¾	3 x 1	4 x 1½
2¼ x ½	2¼ x ¾	3½ x 1	5 x 1½
2½ x ½	2½ x ¾	4 x 1	6 x 1½
2¾ x ½	3 x ¾	4½ x 1	8 x 1½
3 x ½	3½ x ¾	5 x 1	2 x 1¾
3½ x ½	4 x ¾	6 x 1	2¼ x 1¾
4 x ½	4½ x ¾	7 x 1	2½ x 1¾
5 x ½	5 x ¾	8 x 1	3 x 1¾
6 x ½	6 x ¾	3¼ x 1⅛	2¼ x 2
¾ x ⅝	1¼ x ⅞	1½ x 1¼	2½ x 2
⅞ x ⅝	1½ x ⅞	1¾ x 1¼	3 x 2
1 x ⅝	1¾ x ⅞	2 x 1¼	3½ x 2
1¼ x ⅝	2 x ⅞	2¼ x 1¼	4 x 2
1½ x ⅝	2¼ x ⅞	2½ x 1¼	5 x 2
1¾ x ⅝	2½ x ⅞	3 x 1¼	6 x 2
2 x ⅝	3 x ⅞	3¼ x 1¼	7 x 2
2¼ x ⅝	4 x ⅞	3½ x 1¼	8 x 2
2½ x ⅝	4½ x ⅞	4 x 1¼	3 x 2½
3 x ⅝	5 x ⅞	4½ x 1¼	3½ x 2½
3½ x ⅝	1¼ x 1	5 x 1¼	4 x 2½
4 x ⅝	1½ x 1	6 x 1¼	4 x 3
⅞ x ¾	1¾ x 1	1¾ x 1½	5 x 3
1 x ¾	2 x 1	2 x 1½	5 x 4
1¼ x ¾	2¼ x 1	2½ x 1½	

SQUARES

¼	9/16	1⅛	1¾	3½
5/16	⅝	1¼	2	4
⅜	¾	1⅜	2¼	5
7/16	⅞	1½	2½	6
½	1	1⅝	3	

SQUARE BILLETS

6	8

SANDERSON EXTRA CARBON TOOL STEEL BARS

9 Temper—0.95% Carbon

Annealed

ROUNDS

3/4	1	1 1/2	2	2 1/2
13/16	1 1/8	1 5/8	2 1/4	3
7/8	1 1/4	1 3/4		

OCTAGONS

3/8	5/8	7/8	1 N	1 1/4
3/8 N	5/8 N	7/8 N	1 1/8	1 1/4 N
1/2	3/4	1	1 1/8 N	1 1/2 N
1/2 N	3/4 N			

HEXAGONS

1/4	3/8 N	5/8	7/8	1 1/8
1/4 N	7/16	5/8 N	7/8 N	1 1/8 N
5/8	7/16 N	3/4	1	1 1/4
5/8 N	1/2	3/4 N	1 N	1 1/4 N
3/8	1/2 N			

SANDERSON EXTRA CARBON TOOL STEEL BARS

8 Temper — 0.85% Carbon

Annealed

OCTAGONS

3/8	5/8	7/8	1 1/8
1/2	3/4	1	1 1/4

SANDERSON EXTRA NAIL DIE STEEL BARS

11½ Temper — 1.20% Carbon

Cold Drawn Annealed

DOUBLE BEVELED (10)

(#7) 1 27/32 x 1 3/8	(#10) 1 1/2 x 15/16	(#21) 15/16 x 11/16
(#8) 1 5/8 x 1 1/8	(#14) 1 3/8 x 13/16	(#23) 13/16 x 9/16
(#9) 1 13/16 x 15/16	(#16) 1 1/8 x 11/16	

LA BELLE COLD STRIKING DIE STEEL

Carbon 0.95% **Manganese 0.35%** **Silicon 0.45%**

La Belle Cold Striking Die Steel is designed to withstand the high pressure per unit area, impact, and fatigue developed in rapid cold forming operations. It has been outstandingly successful as a die steel for striking nickel, sterling silver and stainless steel cutlery. This steel is a high quality, straight carbon tool steel with very deep hardening characteristics. Rigid melting and processing standards insure uniform quality and hardenability.

Centerless Ground and Annealed

ROUNDS

1 15/16	2 3/16	2 1/4	2 1/2	3 1/8

Annealed

SQUARES

3

FLATS

4 1/2 x 2 1/4 3 1/2 x 2 1/2	4 x 2 1/2 4 1/2 x 2 1/2	5 x 3 1/2

LA BELLE EXTRA CARBON TOOL STEEL BARS

9 Temper — 0.95% Carbon

Annealed

La Belle Extra Tool Steel is most widely used for cold header dies for such products as bolts, small screws and rivets. It hardens in water or brine.

ROUNDS

5/8	1 3/8	2 1/8	2 7/8	3 1/2
3/4	1 1/2	2 1/4	3	3 5/8
7/8	1 5/8	2 3/8	3 1/16	3 3/4
1	1 3/4	2 1/2	3 1/8	4
1 1/8	1 7/8	2 5/8	3 1/4	4 1/2
1 1/4	2	2 3/4		

FLATS

3 1/4 x 2 1/8

LA BELLE EXTRA CARBON TOOL STEEL BARS—*Cont.*

SQUARES

2	2½	3	3⅜
2⅛	2¾	3 1/16	

LA BELLE EXTRA CARBON TOOL STEEL BARS

9 Temper—0.95% Carbon

Centerless Ground Annealed

ROUNDS

†† 5/8	††1⅛	††1⅝	††2	††2 11/16
†† ¾	††1 3/16	††1 11/16	††2 1/16	††2¾
† ⅞	††1¼	††1⅜	††2⅛	††3
†† ⅞	††1 5/16	††1¾	††2¼	††3⅛
†1	††1⅜	††1 13/16	††2⅜	†3⅜
††1	††1 7/16	††1⅞	††2½	††3½
††1 1/16	††1½	††1 15/16	††2⅝	

† +.002-inch −.002-inch. †† +.000-inch −.004-inch.

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS

Black Diamond Standard is a good quality electric furnace melted water hardening carbon tool steel adapted for applications where specific close limits of case depth and grain size are not imperative. This grade has earned an excellent reputation for use as the standard in general shop tools requiring extreme toughness and resistance to shock and impact. It is principally used in the lower carbon ranges for tools such as pins, punches, hammers and sledges.

9 Temper — 0.95% Carbon

Annealed

ROUNDS

¼	¾	1¼	2	3¼
5/16	13/16	1 5/16	2⅛	3½
⅜	⅞	1⅜	2¼	3¾
7/16	15/16	1 7/16	2⅜	4
½	1	1½	2½	4¼
9/16	1 1/16	1⅝	2⅝	4½
⅝	1⅛	1¾	2¾	5
11/16	1 3/16	1⅞	3	6

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS—*Continued*

FLATS

¾ x ⅛	2 x ⅜	2 x ⅝	4 x 1
1 x ⅛	2½ x ⅜	2½ x ⅝	5 x 1
1¼ x ⅛	3 x ⅜	3 x ⅝	6 x 1
1½ x ⅛	4 x ⅜	1 x ¾	1½ x 1¼
2 x ⅛	⅝ x ½	1¼ x ¾	2 x 1¼
½ x ¼	¾ x ½	1½ x ¾	2½ x 1¼
⅝ x ¼	1 x ½	1¾ x ¾	3 x 1¼
¾ x ¼	1¼ x ½	2 x ¾	4 x 1¼
1 x ¼	1½ x ½	2½ x ¾	5 x 1¼
1¼ x ¼	1¾ x ½	3 x ¾	6 x 1¼
1½ x ¼	2 x ½	3½ x ¾	2 x 1½
2 x ¼	2½ x ½	4 x ¾	2½ x 1½
2½ x ¼	3 x ½	5 x ¾	3 x 1½
1 x 5/16	4 x ½	1¼ x ⅞	4 x 1½
1½ x 5/16	5 x ½	1¼ x 1	5 x 1½
½ x ⅜	6 x ½	1½ x 1	6 x 1½
⅝ x ⅜	¾ x ⅝	1¾ x 1	2½ x 2
¾ x ⅜	⅞ x ⅝	2 x 1	3 x 2
1 x ⅜	1 x ⅝	2½ x 1	4 x 2
1¼ x ⅜	1¼ x ⅝	3 x 1	5 x 2
1½ x ⅜	1½ x ⅝	3½ x 1	

SQUARES

¼	¾	1¼	2	3½
5/16	⅞	1⅜	2¼	4
⅜	1	1½	2½	5
½	1⅛	1¾	3	6
⅝				

.80/.90 Carbon

4	4½	5	6

HEXAGONS

¼	½	¾	1	1¼
5/16	⅝	⅞	1⅛	
⅜				

OCTAGONS

⅜	⅝	⅞	1⅛	1½
½	¾	1	1¼	

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS—*Continued*

9 Temper — 0.95% Carbon

Natural

ROUNDS

1/4 5/16 3/8	7/16 1/2 5/8	3/4 7/8 1	1 1/8 1 1/4	1 1/2 2

FLATS

3/4 x 1/4 1 x 1/4 2 1/2 x 1/4 3 x 1/4 3 x 5/16	1 1/4 x 3/8 1 x 1/2 1 1/4 x 1/2 1 1/2 x 1/2 2 x 1/2	3 x 1/2 2 x 3/4 3 x 3/4 1 1/2 x 1	2 x 1 3 x 1 4 x 1 5 x 1

SQUARES

1/4 5/16 3/8	1/2 5/8 3/4	7/8 1 1 1/8	1 1/4 1 1/2 1 3/4	2 2 1/2

HEXAGONS

1/4 5/16 3/8	7/16 1/2 5/8	3/4 7/8	1 1 1/8	1 1/4 1 1/2

OCTAGONS

1/4 5/16 3/8	1/2 5/8 3/4	7/8 1 1 1/8	1 1/4 1 1/2	1 3/4 2

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS

12 Temper

QUARTER OCTAGONS

1/2	5/8	3/4	7/8	1

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS — *Continued*

Annealed

SQUARE BILLETS

6

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS

8 Temper — 0.85% Carbon

Natural

OCTAGONS

½ ⅝	¾ ⅞	1 1⅛	1¼

BLACK DIAMOND STANDARD CARBON TOOL STEEL BARS

7 Temper — 0.75% Carbon

Natural

SQUARES

1¼	1½	1¾	2	2½

GRANADA VANADIUM TOOL STEEL BARS

Carbon 1.00% **Vanadium 0.20%**

Annealed

Granada Vanadium is the Granada analysis plus vanadium to meet the specifications of several large manufacturers in the automotive industry.

ROUNDS

¼ 5/16 ⅜	7/16 ½ 9/16	⅝ 11/16 ¾	†¾ 13/16 ⅞	15/16 1 1 1/16

† 9 Temper (.95 C.)

GRANADA VANADIUM TOOL STEEL BARS—*Continued*

ROUNDS—*Continued*

1 1/8	2 1/16	3 1/8	4 5/8	7
1 1/4	2 1/8	3 1/4	4 3/4	7 1/2
1 5/16	2 1/4	3 3/8	5	8
1 3/8	2 3/8	3 1/2	5 1/4	8 1/2
1 7/16	2 1/2	3 3/4	5 1/2	9
1 1/2	2 5/8	4	5 3/4	9 1/2
1 5/8	2 3/4	4 1/8	6	10
1 3/4	2 7/8	4 1/4	6 1/4	11
1 7/8	3	4 1/2	6 1/2	12
2				

FLATS

1/2 x 1/4	4 x 3/8	1 3/8 x 5/8	2 1/2 x 3/4
5/8 x 1/4	5/8 x 1/2	1 1/2 x 5/8	3 x 3/4
3/4 x 1/4	3/4 x 1/2	1 3/4 x 5/8	3 1/4 x 3/4
1 x 1/4	7/8 x 1/2	2 x 5/8	3 1/2 x 3/4
1 1/4 x 1/4	1 x 1/2	2 1/8 x 5/8	4 x 3/4
1 1/2 x 1/4	1 1/4 x 1/2	2 1/4 x 5/8	4 1/2 x 3/4
1 3/4 x 1/4	1 1/2 x 1/2	2 1/2 x 5/8	5 x 3/4
2 x 1/4	1 5/8 x 1/2	2 3/4 x 5/8	5 1/2 x 3/4
2 1/2 x 1/4	1 3/4 x 1/2	3 x 5/8	6 x 3/4
3 x 1/4	2 x 1/2	3 1/4 x 5/8	7 x 3/4
5 x 1/4	2 1/4 x 1/2	3 1/2 x 5/8	8 x 3/4
6 x 1/4	2 1/2 x 1/2	4 x 5/8	9 x 3/4
1/2 x 3/8	2 3/4 x 1/2	4 1/2 x 5/8	10 x 3/4
5/8 x 3/8	3 x 1/2	5 x 5/8	1 x 7/8
3/4 x 3/8	3 1/2 x 1/2	5 1/2 x 5/8	1 1/8 x 7/8
7/8 x 3/8	3 3/4 x 1/2	6 x 5/8	1 1/4 x 7/8
1 x 3/8	4 x 1/2	6 1/2 x 5/8	1 1/2 x 7/8
1 1/8 x 3/8	4 1/2 x 1/2	7 x 5/8	1 3/4 x 7/8
1 1/4 x 3/8	5 x 1/2	8 x 5/8	2 x 7/8
1 3/8 x 3/8	5 1/2 x 1/2	9 x 5/8	2 1/4 x 7/8
1 1/2 x 3/8	6 x 1/2	10 x 5/8	2 1/2 x 7/8
1 3/4 x 3/8	7 x 1/2	1 x 3/4	3 x 7/8
2 x 3/8	8 x 1/2	1 1/4 x 3/4	3 1/2 x 7/8
2 1/4 x 3/8	10 x 1/2	1 3/8 x 3/4	4 x 7/8
2 1/2 x 3/8	7/8 x 5/8	1 1/2 x 3/4	5 x 7/8
2 3/4 x 3/8	1 x 5/8	1 3/4 x 3/4	6 x 7/8
3 x 3/8	1 1/8 x 5/8	2 x 3/4	1 1/4 x 1
3 1/2 x 3/8	1 1/4 x 5/8	2 1/4 x 3/4	1 1/2 x 1

GRANADA VANADIUM TOOL STEEL BARS— *Continued*

FLATS— *Continued*

1¾ x 1	4½ x 1¼	3¾ x 1¾	6 x 2¼
2 x 1	4¾ x 1¼	4 x 1¾	6½ x 2¼
2¼ x 1	5 x 1¼	4½ x 1¾	7 x 2¼
2½ x 1	5½ x 1¼	5 x 1¾	8 x 2¼
2¾ x 1	6 x 1¼	5½ x 1¾	2¾ x 2½
3 x 1	6½ x 1¼	6 x 1¾	3 x 2½
3¼ x 1	7 x 1¼	6½ x 1¾	3¼ x 2½
3½ x 1	8 x 1¼	7 x 1¾	3½ x 2½
3¾ x 1	9 x 1¼	8 x 1¾	4 x 2½
4 x 1	10 x 1¼	2¼ x 2	4½ x 2½
4¼ x 1	12 x 1¼	2½ x 2	5 x 2½
4½ x 1	1¾ x 1½	2¾ x 2	5½ x 2½
5 x 1	2 x 1½	3 x 2	6 x 2½
5½ x 1	2¼ x 1½	3¼ x 2	6½ x 2½
6 x 1	2½ x 1½	3½ x 2	7 x 2½
6½ x 1	2¾ x 1½	3¾ x 2	7½ x 2½
7 x 1	3 x 1½	4 x 2	8 x 2½
8 x 1	3¼ x 1½	4¼ x 2	9 x 2½
9 x 1	3½ x 1½	4½ x 2	10 x 2½
10 x 1	4 x 1½	4¾ x 2	12 x 2½
12 x 1	4¼ x 1½	5 x 2	3 x 2¾
1¾ x 1⅛	4½ x 1½	5½ x 2	3¼ x 2¾
2 x 1⅛	4¾ x 1½	6 x 2	3½ x 2¾
2¼ x 1⅛	5 x 1½	6½ x 2	4 x 2¾
2½ x 1⅛	5½ x 1½	7 x 2	4½ x 2¾
3 x 1⅛	6 x 1½	7½ x 2	5 x 2¾
3½ x 1⅛	6½ x 1½	8 x 2	5½ x 2¾
4 x 1⅛	7 x 1½	9 x 2	6 x 2¾
1½ x 1¼	7½ x 1½	10 x 2	3¼ x 3
1¾ x 1¼	8 x 1½	12 x 2	3½ x 3
2 x 1¼	9 x 1½	2½ x 2¼	4 x 3
2¼ x 1¼	10 x 1½	2¾ x 2¼	4½ x 3
2½ x 1¼	12 x 1½	3 x 2¼	5 x 3
2¾ x 1¼	2 x 1¾	3¼ x 2¼	5½ x 3
3 x 1¼	2¼ x 1¾	3½ x 2¼	6 x 3
3¼ x 1¼	2½ x 1¾	3¾ x 2¼	5 x 3½
3½ x 1¼	2¾ x 1¾	4 x 2¼	5 x 4
3¾ x 1¼	3 x 1¾	4½ x 2¼	5½ x 4
4 x 1¼	3¼ x 1¾	5 x 2¼	6 x 5
4¼ x 1¼	3½ x 1¾	5½ x 2¼	7 x 6

GRANADA VANADIUM TOOL STEEL BARS—
Continued

SQUARES

3/8	1	1 7/8	3 1/4	4 3/4
7/16	1 1/8	2	3 1/2	5
1/2	1 1/4	2 1/4	3 3/4	5 1/2
5/8	1 3/8	2 1/2	4	6
3/4	1 1/2	2 3/4	4 1/4	8
7/8	1 3/4	3	4 1/2	10

SQUARE BILLETS

4	6	8

AUTOMOTIVE DIE STEEL BARS

Carbon 1.00%

Automotive Die Steel is provided especially for the automotive industry. It is principally used in blanking and forming operations.

These grades, along with Granada, are stocked in a wide range of sizes for immediate shipment at Crucible's Detroit Warehouse.

CRUCIBLE DOUBLE SPECIAL TOOL STEEL BARS

Carbon 1.30% **Tungsten 3.50%**

Annealed

Crucible Double Special is among the earliest of the shallow hardening alloy tool steels and owes its properties to the substantial addition of tungsten. This steel becomes intensively hard after quenching in water or brine.

The exceptional wear resistance of Crucible Double Special is due to the high hardness obtained on quenching and to the presence of extremely hard tungsten carbides uniformly distributed through the matrix.

ROUNDS

3/8	7/8	1 3/8	1 7/8
1/2	1	1 1/2	2
5/8	1 1/8	1 5/8	2 1/4
3/4	1 1/4	1 3/4	3

CRUCIBLE DOUBLE SPECIAL TOOL STEEL BARS — *Continued*

FLATS		
5/8 x 1/4	2 x 1/4	1 1/2 x 5/8
SQUARES		
1/2	3/4	1 1/4

HOLLOW TOOL STEELS

Index

HOLLOW TOOL STEELS

Index

CRUCIBLE HOLLOW TOOL STEEL

Crucible Hollow Tool Steel offers the well-known Crucible quality in a form ideally suited to parts with cut-out centers. Manufacturers of stamp dies, sleeves, ring gauges, rolls, slitters and similar parts look to Airdi 150, Airkool, Nu-Die V, Ketos, and Sanderson Hollow Tool Steel for fast economical production. By using Crucible Hollow Tool Steel they save the cost of the center metal and the cost of machining it out. Our warehouses have Crucible Hollow Tool Steel, forged and rough machined on the O.D. and I.D., in the sizes shown below ready for cutting to the length you need. Your inquiries are invited.

SANDERSON HOLLOW TOOL STEEL BARS

Carbon 1.10% **Manganese 0.25%** **Silicon 0.20%**

Deep hardening, water quenching steel for use where wear resistance is a factor. Not recommended for intricate shapes or where complete freedom from distortion is important.

Bar Color—Black

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2	O.D.	x 1	I.D.	7½	O.D.	x 3	I.D.	11	O.D.	x 6	I.D.
3¼	"	x 1¼	"	7½	"	x 3½	"	12	"	x 5	"
3½	"	x 1½	"	8	"	x 3½	"	12	"	x 6	"
3½	"	x 2	"	8	"	x 5	"	12	"	x 7	"
4½	"	x 2	"	8½	"	x 5¼	"	13	"	x 7	"
5	"	x 2	"	9	"	x 4	"	14	"	x 7	"
5	"	x 3	"	9	"	x 6	"	15	"	x 10	"
5½	"	x 2½	"	10	"	x 5	"	15	"	x 11	"
6	"	x 3	"	10	"	x 6	"	16	"	x 10	"
7	"	x 3	"	11	"	x 4	"	16	"	x 12	"
7	"	x 4	"								

KETOS HOLLOW TOOL STEEL BARS

Carbon 0.90% **Manganese 1.25%** **Chromium 0.50%**
Tungsten 0.50%

Oil hardening, non-deforming type which hardens at fairly low temperatures with minimum distortion. Hardens deeply, with fine tough grained structure.

Bar Color—Green

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2	O.D.	x 1	I.D.	6	O.D.	x 3	I.D.	11	O.D.	x 6	I.D.
2½	"	x 1	"	6½	"	x 3½	"	11	"	x 7	"
2½	"	x 1½	"	7	"	x 3	"	12	"	x 5	"
3	"	x 1	"	7	"	x 4	"	12	"	x 6	"
3	"	x 1½	"	7½	"	x 3	"	12	"	x 7	"
3¼	"	x 1¼	"	7½	"	x 3½	"	12	"	x 8	"
3¼	"	x 1½	"	8	"	x 3½	"	13	"	x 6	"
3½	"	x 2	"	8	"	x 5	"	13	"	x 7	"
4	"	x 1½	"	8½	"	x 5¼	"	13	"	x 9	"
4	"	x 2	"	9	"	x 4	"	14	"	x 7	"
4½	"	x 2	"	9	"	x 5	"	14	"	x 10	"
5	"	x 2	"	10	"	x 4	"	15	"	x 9	"
5	"	x 2½	"	10	"	x 5	"	15	"	x 10	"
5	"	x 3	"	10	"	x 6	"	16	"	x 10	"
5½	"	x 2	"	11	"	x 4	"	16	"	x 12	"
6	"	x 2	"								

NU-DIE V HOLLOW TOOL STEEL BARS

Carbon 0.40% **Silicon 1.05%** **Molybdenum 1.35%**
Chromium 5.00% **Vanadium 1.10%**

Adapted for hot work applications in aluminum and magnesium die casting sleeves. Air hardening characteristics permit safe hardening with minimum distortion. Has exceptional resistance to heat checking and the erosive action of molten aluminum and magnesium alloys. Can be nitrided if desired.

Bar Color—Yellow

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2¼	O.D.	x 1	I.D.	4½	O.D.	x 2½	I.D.	5½	O.D.	x 2½	I.D.
2½	"	x 1¼	"	4¾	"	x 1¾	"	5½	"	x 3	"
3	"	x 1½	"	5	"	x 1½	"	6	"	x 2¼	"
3¼	"	x 1½	"	5	"	x 2	"	6	"	x 3	"
4	"	x 1¾	"	5	"	x 2½	"	6¼	"	x 3 9/16	"
4	"	x 2¼	"	5	"	x 3	"	6¾	"	x 3⅝	"
4¼	"	x 2	"	5½	"	x 2	"	7¼	"	x 3¾	"
4½	"	x 2	"								

AIRKOOL HOLLOW TOOL STEEL BARS

Carbon 1.00% **Chromium 5.25%** **Molybdenum 1.15%**
Vanadium 0.40%

Air hardening 5% Chrome Tool Steel of intermediate wear and abrasion resistance between oil hardening and high Carbon, high Chrome types. Offers superior toughness, with minimum distortion in hardening and easy machining. Deep hardening type.

Bar Color—Red

All bars have been rough turned and bored free from decarburization with stock allowed to finish to sizes shown.

2	O.D.	x 1	I.D.	5½	O.D.	x 2½	I.D.	10	O.D.	x 6	I.D.
2¼	"	x 1	"	6	"	x 2	"	11	"	x 5	"
3	"	x 1	"	6½	"	x 3	"	11	"	x 7	"
3	"	x 1½	"	7	"	x 3	"	12	"	x 6½	"
3¼	"	x 1½	"	7	"	x 4	"	12	"	x 8	"
3½	"	x 1½	"	7½	"	x 4	"	13	"	x 8	"
4	"	x 2	"	8	"	x 4	"	14	"	x 8	"
4	"	x 2¼	"	8	"	x 5	"	14	"	x 10	"
5	"	x 2	"	8½	"	x 4	"	15	"	x 8	"
5	"	x 2¾	"	9	"	x 4	"	16	"	x 10	"
5	"	x 3	"	9	"	x 6	"				

AIRDI 150 HOLLOW TOOL STEEL BARS

Carbon 1.50% **Chromium 11.50%** **Molybdenum 0.80%**
Vanadium 0.90%

High Carbon, high Chrome, air-hardening type with deep hardening, non-deforming characteristics and superior wear and abrasion resistance.

Bar Color—Blue

All bars have been rough turned and bored free from decarburization with stock allowed to finish in sizes shown.

3	O.D.	x 1	I.D.	5½	O.D.	x 2½	I.D.	8½	O.D.	x 5¼	I.D.
3¼	"	x 1¼	"	6	"	x 1¾	"	9	"	x 5	"
3½	"	x 1	"	6	"	x 3	"	10	"	x 6	"
3½	"	x 2	"	6½	"	x 3¼	"	11	"	x 7	"
4	"	x 1½	"	6½	"	x 4	"	12	"	x 5	"
4	"	x 2	"	7	"	x 2¼	"	13	"	x 6	"
4¼	"	x 1¾	"	7	"	x 3½	"	13	"	x 8	"
4½	"	x 2	"	7½	"	x 4	"	14	"	x 7	"
5	"	x 2	"	8	"	x 5	"	15	"	x 9	"
5	"	x 2½	"	8¼	"	x 3½	"	16	"	x 10	"
5½	"	x 1¾	"								

DRILL RODS

Index

DRILL RODS

Index

DRILL RODS

Crucible's Drill Rods of high speed, alloy and carbon tool steels are produced entirely in the mills of the Crucible Steel Company of America. The process from initial melting to final inspection is performed by experienced craftsmen under the exacting supervision of experts in tool steel manufacture.

Because of this unified manufacturing skill and supervision . . . under constant laboratory control . . . Crucible's Drill Rods have long been famous for guaranteed high quality. Such Crucible trade names as Rex AA, Rex M-2, Special and Victor are well and favorably known wherever drill rods are used.

Every standard size of high speed, alloy and carbon steel drill rod is regularly produced by Crucible and Crucible warehouses carry large stocks of the types, finishes and sizes for which there is any appreciable demand.

Lists of available drill rod stock are given on the following pages.

CHARACTERISTICS OF CRUCIBLE'S DRILL RODS:

1. **Close size tolerance**
2. **True roundness**
3. **Superior finish**
4. **Controlled analysis**
5. **Sound metal**
6. **Freedom from surface decarburization**
7. **Annealed and processed for best machinability, consistent with the analysis of each grade**

This refers to round Crucible Drill Rods carried in stock, unless otherwise noted. Square and rectangular Crucible Drill Rods are customarily furnished lime drawn, unpolished.

Special cut lengths, special hardness and special analyses, not regularly stocked, can be supplied. See your Crucible representative.

STANDARD MANUFACTURING SIZE TOLERANCES

ROUNDS		*FLATS—SQUARES HEXAGONS—OCTAGONS*	
Size Range	*Plus or Minus*	*Dimension—Inches*	*Plus or Minus*
1.500 to .500	.001	1 to ¾	.0015
.499 to .125	.0005	11/16 to ¼	.001
.125 and Under	.0003	Under ¼	.0005

REX AA HIGH SPEED DRILL RODS

Carbon 0.73% **Chromium 4.00%** **Vanadium 1.15%**
Tungsten 18.00%

Rex AA High Speed Drill Rods are so manufactured that they are outstanding in freedom from decarburization, accuracy of size and fineness of finish. They offer consistent uniformity of quality for the making of such products as taps, reamers, drills and punches.

ROUNDS—3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/32	.0312	5/32	.1562	11/32	.3437
60	.040	22	.157	23/64	.3593
58	.042	11/64	.1718	3/8	.375
56	.0465	16	.177	25/64	.3906
55	.052	13	.185	13/32	.4062
1/16	.0625	3/16	.1875	27/64	.4218
51	.067	12	.189	7/16	.4375
50	.070	9	.196	29/64	.4531
46	.081	7	.201	15/32	.4687
44	.086	13/64	.2031	1/2	.500
3/32	.0937	4	.209	33/64	.5156
37	.104	7/32	.2187	17/32	.5312
7/64	.1093	2	.221	9/16	.5625
32	.116	A	.234	5/8	.625
31	.120	1/4	.250	11/16	.6875
1/8	.125	17/64	.2656	3/4	.750
30	.1285	9/32	.2812	13/16	.8125
9/64	.1406	19/64	.2968	7/8	.875
27	.144	5/16	.3125	15/16	.9375
26	.147	21/64	.3281	1	1.000
				1 3/8	1.375

REX M-2 HIGH SPEED DRILL RODS

Carbon 0.83% **Tungsten 6.40%** **Chromium 4.15%**
Molybdenum 5.00% **Vanadium 1.90%**

Rex M-2 High Speed Drill Rods, manufactured to Crucible's high standards of quality, are outstanding in accuracy of size, freedom from decarburization and fineness of finish. This type drill rod is recommended for general purpose use for the making of small tools.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	19/64	.2968	1/2	.500
1/8	.125	5/16	.3125	17/32	.5312
5/32	.1562	21/64	.3281	9/16	.5625
11/64	.1718	11/32	.3437	5/8	.625
3/16	.1875	23/64	.3593	21/32	.6562
13/64	.2031	3/8	.375	11/16	.6875
7/32	.2187	25/64	.3906	3/4	.750
1/4	.250	13/32	.4062	13/16	.8125
17/64	.2656	7/16	.4375	7/8	.875
9/32	.2812	29/64	.4531	15/16	.9375
				1	1.000

AIRKOOL DRILL RODS

Carbon 1.00% **Manganese 0.40%** **Chromium 5.25%**
Vanadium 0.40% **Molybdenum 1.15%**

Airkool drill rods possess superior toughness together with excellent non-deforming properties. This steel machines very readily and has fairly high abrasion resistance.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	1/4	.250	9/16	.5625
3/32	.0937	5/16	.3125	5/8	.625
1/8	.125	3/8	.375	3/4	.750
5/32	.1562	7/16	.4375	1	1.000
3/16	.1875	1/2	.500		

KETOS OIL HARDENING DRILL RODS

Carbon 0.90% **Manganese 1.30%** **Chromium 0.50%** **Tungsten 0.50%**

Ketos Oil Hardening Drill Rods are widely used where minimum distortion during hardening is required. They are recommended for knock-out pins and small tools such as drills, taps, and reamers.

ROUNDS—3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/32	.0312	29	.134	3	.212
3/64	.0468	28	.139	—	.216
1/16	.0625	9/64	.1406	7/32	.2187
50	.069	—	.142	—	.222
49	.072	27	.143	1	.227
48	.075	26	.146	—	.230
5/64	.0781	25	.148	15/64	.2343
46	.0789	24	.151	B	.238
45	.081	23	.153	C	.242
—	.084	22	.155	—	.244
44	.085	5/32	.1562	D	.246
43	.088	21	.157	—	.248
—	.089	20	.161	1/4	.250
42	.092	19	.164	—	.253
3/32	.0937	—	.166	F	.257
41	.095	18	.168	—	.261
40	.097	—	.169	17/64	.2656
—	.099	11/64	.1718	—	.268
38	.101	16	.175	—	.271
37	.103	15	.178	J	.277
—	.104	14	.180	—	.280
36	.106	13	.182	9/32	.2812
35	.108	12	.185	—	.286
7/64	.1093	3/16	.1875	—	.290
—	.110	—	.189	—	.293
33	.112	10	.191	19/64	.2968
—	.1135	9	.194	—	.302
32	.115	—	.195	—	.305
—	.118	8	.197	5/16	.3125
31	.120	7	.199	—	.320
—	.122	6	.201	P	.323
1/8	.125	13/64	.2031	—	.327
30	.127	5	.204	21/64	.3281
—	.128	4	.207	—	.338
—	.131	—	.208	—	.342

KETOS OIL HARDENING DRILL RODS—*Continued*

ROUNDS—3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
11/32	.3437	15/32	.4687	45/64	.7031
—	.352	31/64	.4843	23/32	.7187
—	.354	—	.491	—	.739
T	.358	1/2	.500	3/4	.750
23/64	.3593	—	.503	25/32	.7812
—	.360	33/64	.515	13/16	.8125
U	.368	—	.520	27/32	.8437
—	.372	17/32	.5312	7/8	.875
3/8	.375	35/64	.5469	29/32	.9062
—	.382	—	.558	15/16	.9375
—	.384	—	.560	31/32	.96875
25/64	.3906	9/16	.5625	63/64	.9843
X	.397	37/64	.5781	1	1.000
—	.400	—	.582	1 1/64	1.0156
13/32	.4062	19/32	.5937	1 1/16	1.0625
27/64	.4218	39/64	.6093	1 1/8	1.125
—	.428	—	.616	1 3/16	1.1875
—	.430	5/8	.625	1 1/4	1.250
7/16	.4375	41/64	.6406	1 5/16	1.3125
—	.440	21/32	.6562	1 3/8	1.375
—	.452	—	.677	1 7/16	1.4375
29/64	.4531	11/16	.6875	1 1/2	1.500
—	.462				

KETOS LIME DRAWN DRILL RODS

Annealed and Pickled

3 FOOT LENGTHS

3/32 x 1/16	1/4 x 3/32	3/16 x 5/32	5/16 x 3/16
1/8 x 1/16	3/16 x 1/8	1/4 x 5/32	3/8 x 3/16
1/4 x 1/16	1/4 x 1/8	5/16 x 5/32	1/2 x 3/16
1/8 x 3/32	3/8 x 1/8	7/32 x 3/16	3/4 x 3/16
3/16 x 3/32	3/4 x 1/8	1/4 x 3/16	7/8 x 3/16

KETOS LIME DRAWN DRILL RODS—*Continued*

Annealed and Pickled

3 FOOT LENGTHS—*Continued*

1 x 3/16	5/8 x 1/4	1 x 5/16	3/4 x 1/2
1/4 x 7/32	3/4 x 1/4	1/2 x 3/8	7/8 x 1/2
5/16 x 7/32	7/8 x 1/4	9/16 x 3/8	1 x 1/2
3/8 x 7/32	1 x 1/4	5/8 x 3/8	1 1/4 x 1/2
5/16 x 1/4	7/16 x 5/16	3/4 x 3/8	1 5/16 x 1/2
3/8 x 1/4	1/2 x 5/16	1 x 3/8	3/4 x 5/8
7/16 x 1/4	5/8 x 5/16	1 1/4 x 3/8	7/8 x 5/8
1/2 x 1/4	3/4 x 5/16	3/4 x 7/16	1 x 5/8
9/16 x 1/4	7/8 x 5/16	5/8 x 1/2	1 x 3/4

SQUARES

1/8	1/4	7/16	5/8	7/8
3/16	5/16	1/2	3/4	1
7/32	3/8	9/16		

CRUCIBLE DOUBLE SPECIAL DRILL RODS

Carbon 1.30% **Tungsten 3.50%**

Crucible Double Special Drill Rods are recommended for tools requiring a very keen cutting edge to be used for cutting soft non-ferrous metals such as brass and aluminum alloys.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	1/4	.250	9/16	.5625
3/32	.0937	5/16	.3125	5/8	.625
1/8	.125	3/8	.375	3/4	.750
5/32	.1562	7/16	.4375	1	1.000
3/16	.1875	1/2	.500		

HALCOMB 218 DRILL RODS

Carbon 0.40% **Silicon 1.05%** **Chromium 5.00%**
Molybdenum 1.35% **Vanadium 0.35%**

Halcomb 218 Drill Rods among other applications are extensively used for pins in plastic molding dies since this type steel successfully resists the high temperatures encountered in the molding of plastics.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
3/32	.0937	11/32	.3437	21/32	.6562
1/8	.125	3/8	.375	11/16	.6875
5/32	.1562	13/32	.4062	23/32	.7187
3/16	.1875	7/16	.4375	47/64	.7343
7/32	.2187	15/32	.4687	3/4	.750
1/4	.250	1/2	.500	13/16	.8125
17/64	.2656	9/16	.5625	7/8	.875
9/32	.2812	5/8	.625	1	1.000
5/16	.3125				

ALVA EXTRA DRILL RODS

Carbon 0.95% **Vanadium 0.20%**

Alva Extra Drill Rods are recommended for applications requiring a slightly tougher tool than could be developed from carbon tool drill rod. This grade is also recommended for punches and knockout pins and for drills and taps.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	9/64	.1406	15/64	.2343
5/64	.078	5/32	.1562	1/4	.250
3/32	.0937	3/16	.1875	17/64	.2656
7/64	.1093	13/64	.203	9/32	.2812
1/8	.125	7/32	.2187	18/64	.2968

ALVA EXTRA DRILL RODS—*Continued*

ROUNDS—3 FOOT LENGTHS—*Continued*

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
5/16	.3125	7/16	.4375	5/8	.625
21/64	.3281	29/64	.4531	11/16	.6875
11/32	.3437	15/32	.4687	3/4	.750
23/64	.3593	31/64	.4843	13/16	.8125
3/8	.375	1/2	.500	7/8	.875
25/64	.3906	17/32	.5312	1	1.000
13/32	.4062	9/16	.5625	1 1/4	1.250
27/64	.4218	39/64	.6093		

ATHA PNEU LIME DRAWN DRILL RODS

3 FOOT LENGTHS

1/2 x 3/8	5/8 x 3/8	5/8 x 1/2

SANDERSON SPECIAL DRILL RODS

Carbon 1.25%

Special Drill Rods are outstanding in the field of carbon tool steel drill rods due to their high uniformity of quality, accuracy of size, high finish, and freedom from decarburization. This grade is used principally for small taps, reamers, punches, twist drills, dental tools, watch parts and hardened pins and in all cases where a high grade carbon tool steel of drill rod size and finish is required.

ROUNDS—3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
80	.013	78	.015	77	.016
79	.014	1/64	.0156	76	.018

SANDERSON SPECIAL DRILL RODS—*Continued*

ROUNDS—3 FOOT LENGTHS—*Continued*

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
75	.020	42	.092	3/16	.1875
74	.022	3/32	.0937	11	.188
73	.023	41	.095	10	.191
72	.024	40	.097	9	.194
71	.026	39	.099	8	.197
70	.027	38	.101	7	.199
69	.029	37	.103	6	.201
68	.030	36	.106	13/64	.2031
67	.031	35	.108	5	.204
1/32	.0312	7/64	.1093	4	.207
66	.032	34	.110	3	.212
65	.033	33	.112	7/32	.2187
64	.035	32	.115	2	.219
63	.036	31	.120	1	.227
62	.037	1/8	.125	A	.234
61	.038	30	.127	15/64	.2343
60	.039	29	.134	B	.238
59	.040	28	.139	C	.242
58	.041	9/64	.1406	D	.246
57	.042	27	.143	1/4	.250
56	.045	26	.146	F	.257
3/64	.0468	25	.148	G	.261
55	.050	24	.151	17/64	.2656
54	.055	23	.153	H	.266
53	.058	22	.155	I	.272
1/16	.0625	5/32	.1562	J	.277
52	.063	21	.157	K	.281
51	.066	20	.161	9/32	.2812
50	.069	19	.164	L	.290
49	.072	18	.168	M	.295
48	.075	11/64	.1718	19/64	.2968
47	.077	17	.172	N	.302
5/64	.078	16	.175	5/16	.3125
46	.079	15	.178	O	.316
45	.081	14	.180	P	.323
44	.085	13	.182	21/64	.3281
43	.088	12	.185	Q	.332

SANDERSON SPECIAL DRILL RODS—*Continued*

ROUNDS — 3 FOOT LENGTHS—*Continued*

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
R	.339	31/64	.4843	49/64	.7656
11/32	.3437	1/2	.500	25/32	.7812
S	.348	33/64	.5156	51/64	.7968
T	.358	17/32	.5312	13/16	.8125
23/64	.3593	35/64	.5468	53/64	.8281
U	.368	9/16	.5625	27/32	.8437
3/8	.375	37/64	.5781	55/64	.8593
V	.377	19/32	.5937	7/8	.875
W	.386	39/64	.6093	29/32	.9062
25/64	.3906	5/8	.625	59/64	.9218
X	.397	41/64	.6406	15/16	.9375
Y	.404	21/32	.6562	31/32	.9687
13/32	.4062	43/64	.6718	1	1.000
Z	.413	11/16	.6875	1 1/16	1.0625
27/64	.4218	45/64	.7031	1 1/8	1.125
7/16	.4375	23/32	.7187	1 3/16	1.1875
29/64	.4531	47/64	.7343	1 1/4	1.250
15/32	.4687	3/4	.750	1 1/2	1.500

SQUARES — 3 FOOT LENGTHS—LIME DRAWN

1/16	.0625	1/4	.250	9/16	.5625
3/32	.0937	5/16	.3125	5/8	.625
1/8	.125	3/8	.375	3/4	.750
5/32	.1562	7/16	.4375	7/8	.875
3/16	.1875	1/2	.500	1	1.000

AIRDI-150 DRILL ROD

Carbon 1.50% **Chromium 11.50%** **Vanadium 0.90%** **Molybdenum 0.80%**

ROUNDS—3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/4	.250	3/8	.375	3/4	.750
5/16	.3125	1/2	.500	1	1.000

CSM-2 DRILL ROD

Carbon 0.30% **Manganese 0.75%** **Silicon 0.50%**
Chromium 0.80% **Molybdenum 0.25%**

ROUNDS—3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	1/8	.125	3/16	.1875
3/32	.0937				

VICTOR DRILL RODS

Carbon 1.00%

Victor is recommended for general use where a good quality hardening steel is required, demanding the size, accuracy and finish of drill rods. This grade is furnished true to roundness and within very close size tolerances. It is produced in special lengths for production applications. Widely used in automatic screw machine work, it has excellent free machining qualities. This grade is not recommended for use in comparison with the Special Carbon Tool Steel grade when a keen cutting edge is required. For shafts, rollers, pins, dowel pins, push rods, and other hardened wearing parts, Victor Drill Rod offers many of the advantages of the higher grade rods at a cost consistent with the physical properties required in the finished product.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	44	.085	35	.108
52	.063	43	.088	7/64	.1093
51	.066	42	.092	34	.110
50	.069	3/32	.0937	33	.112
49	.072	41	.095	32	.115
48	.075	40	.097	31	.120
47	.077	39	.099	1/8	.125
5/64	.0781	38	.101	30	.127
46	.079	37	.103	29	.134
45	.081	36	.106	28	.139

VICTOR DRILL RODS—*Continued*

ROUNDS—3 FOOT LENGTHS—*Continued*

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
9/64	.1406	H	.266	41/64	.6406
27	.143	I	.272	21/32	.6562
26	.146	J	.277	43/64	.6718
25	.148	K	.281	11/16	.6875
24	.151	9/32	.2812	45/64	.7031
23	.153	L	.290	23/32	.7187
22	.155	M	.295	47/64	.7343
5/32	.1562	19/64	.2968	3/4	.750
21	.157	N	.302	49/64	.7656
20	.161	5/16	.3125	25/32	.7812
19	.164	O	.316	51/64	.7968
18	.168	P	.323	13/16	.8125
11/64	.1718	21/64	.3281	53/64	.8281
17	.172	Q	.332	27/32	.84375
16	.175	R	.339	55/64	.8593
15	.178	11/32	.3437	7/8	.875
14	.180	S	.348	57/64	.8906
13	.182	T	.358	29/32	.9062
12	.185	23/64	.3593	59/64	.9218
3/16	.1875	U	.368	15/16	.9375
11	.188	3/8	.375	61/64	.9531
10	.191	V	.377	31/32	.9687
9	.194	W	.386	63/64	.9843
8	.197	25/64	.3906	1	1.000
7	.199	X	.397	1 1/64	1.0156
6	.201	Y	.404	1 1/32	1.0312
13/64	.2031	13/32	.4062	1 3/64	1.0468
5	.204	Z	.413	1 1/16	1.0625
4	.207	27/64	.4218	1 3/32	1.0937
3	.212	7/16	.4375	1 1/8	1.125
7/32	.2187	29/64	.4531	1 5/16	1.1875
2	.219	15/32	.4687	1 7/32	1.2187
1	.227	31/64	.4843	1 1/4	1.250
A	.234	1/2	.500	1 9/32	1.2812
15/64	.2343	33/64	.5156	1 5/16	1.3215
B	.238	17/32	.5312	1 3/8	1.375
C	.242	35/64	.5468	1 13/32	1.4062
D	.246	9/16	.5625	1 7/16	1.4375
1/4	.250	37/64	.5781	1 1/2	1.500
F	.257	19/32	.5937	1 5/8	1.625
G	.261	39/64	.6093	1 3/4	1.750
17/64	.2656	5/8	.625	2	2.000

VICTOR DRILL RODS—*Continued*

ROUNDS — 12 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
1/16	.0625	9/32	.2812	3/4	.750
3/32	.0937	5/16	.3125	13/16	.8125
1/8	.125	3/8	.375	7/8	.875
9/64	.1406	7/16	.4375	15/16	.9375
5/32	.1562	1/2	.500	1	1.000
11/64	.1718	9/16	.5625	1 1/8	1.125
3/16	.1875	5/8	.625	1 1/4	1.250
7/32	.2187	11/16	.6875	1 1/2	1.500
1/4	.250				

NU-DIE DRILL RODS

Carbon 0.40% **Silicon 1.05%** **Chromium 5.00%**
Vanadium 0.35% **Molybdenum 1.35%**

Nu-Die Drill Rods are widely used in the die casting industry for such applications as cores and various types of pins.

ROUNDS — 3 FOOT LENGTHS

Gauge or Nearest Fractional Dimension	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*	*Gauge or Nearest Fractional Dimension*	*Size Decimals of an Inch*
3/32	.0937	11/32	.3437	21/32	.6562
1/8	.125	3/8	.375	11/16	.6875
5/32	.1562	13/32	.4062	23/32	.7187
3/16	.1875	7/16	.4375	47/64	.7343
7/32	.2187	15/32	.4687	3/4	.750
1/4	.250	1/2	.500	13/16	.8125
17/64	.2656	9/16	.5625	7/8	.875
9/32	.2812	5/8	.625	1	1.000
5/16	.3125				

CRUCIBLE *REZISTAL*® STAINLESS STEELS

Index

CRUCIBLE *REZISTAL*® STAINLESS STEELS

Index

The answers to most of your questions about stainless steels are right at your finger tips, when you use Crucible's unique new Stainless Steel Selector.

Want to know the machinability characteristics of a stainless grade? Resistance to corrosion or scaling? Physical or mechanical properties? You can get the answers to these and other questions simply by setting the arrow on the Selector slide at the proper window. It's just as quick and easy as that.

And almost as fast as you get the answer, you can get the steel you need. For many of the REZISTAL stainless steels shown on the Selector are carried in stock in Crucible warehouses conveniently located throughout the country.

Write for your free copy today!

HOW THE SELECTOR WORKS:

Start with the problem. For example, resistance to corrosion in contact with copper sulfate. Just set the slide at the proper index number shown on the Selector (in this case on the back), and you have the answer in a second—grades 302 and 316 are fully resistant to this form of attack.

REZISTAL 202 STAINLESS STEEL

Carbon 0.15% max. Manganese 7.50/10.00% max. Silicon 1.00% max. Phosphorus 0.060% max. Sulphur 0.030% max. Chromium 17.00/19.00% Nickel 4.00/6.00% Nitrogen 0.25% max.

Rezistal 202 is a non-hardenable austenitic chromium-manganese-nickel steel which is a general purpose corrosion resisting steel. This grade is non-magnetic in the annealed condition, but is slightly magnetic when cold worked.

PHYSICAL PROPERTIES

Modulus of Elasticity in Tension—psi	28,600,000
Modulus of Elasticity in Torsion—psi	12,600,000
Specific Electrical Resistance	
Room Temperature—microhms/cu. in.	28.4
Specific Heat—Btu/lb./°F (32-212F)	0.12
Specific Gravity	7.94
Weight—(lb./cu. in.)	0.287
Thermal Conductivity—Btu/hr./sq. ft./°F/ft.	
At 200 F	9.4
1000 F	12.5
Mean Coefficient of Thermal Expansion—in./in./°F x 10^{-6}	
32– 212 F	9.7
32– 600 F	10.2
32–1000 F	10.7
32–1200 F	10.9
Melting Point Range—F	2550/2590

SIZE RANGES

Any of the sizes and finishes listed on the following pages for Rezistal 302 Stainless Steel are available in the Rezistal 202 material.

REZISTAL 301 STAINLESS STEEL

Carbon 0.15% max. Manganese 2.00% max. Silicon 1.00% max. Phosphorus 0.045% max. Sulphur 0.03% max. Chromium 16.00/18.00% Nickel 6.00/8.00%

Rezistal 301 is a non-hardenable austenitic chromium nickel steel, capable of easily attaining high tensile strength and excellent ductility by moderate or severe cold working. Rezistal 301 is non-magnetic in the annealed condition, but becomes slightly magnetic when cold worked.

SHEETS

#2B Finish

Est. Lbs. per Sheet	*Size ¼ Hard*	*Est. Lbs. per Sheet*	*Size ½ Hard*
78.750	16 Ga x 36 x 120	22.1	25 Ga x 36 x 120
63.000	18 Ga x 36 x 120	78.750	16 Ga x 36 x 120
47.25	20 Ga x 36 x 120	63.00	18 Ga x 36 x 120
39.375	22 Ga x 36 x 120	47.25	20 Ga x 36 x 120
31.50	24 Ga x 36 x 120	22.1	25 Ga x 36 x 120

REZISTAL 302 STAINLESS STEEL

Carbon over 0.08/0.20% **Manganese 2.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 17.00/19.00%**
Nickel 8.00/10.00%

Rezistal 302 is a non-hardenable austenitic chromium nickel steel which is the general purpose corrosion resisting steel. This grade is non-magnetic in the annealed condition, but is slightly magnetic when cold worked.

SHEETS

#2B Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
236.26	10 Ga x 48 x 120	118.3	16 Ga x 54 x 120
126.00	11 Ga x 36 x 96	50.40	18 Ga x 36 x 96
157.50	11 Ga x 36 x 120	63.00	18 Ga x 36 x 120
210.00	11 Ga x 48 x 120	84.00	18 Ga x 48 x 120
110.25	12 Ga x 36 x 96	39.812	19 Ga x 26 x 120
137.82	12 Ga x 36 x 120	55.125	19 Ga x 36 x 120
183.76	12 Ga x 48 x 120	37.80	20 Ga x 36 x 96
229.5	12 Ga x 60 x 120	47.25	20 Ga x 36 x 120
94.6	13 Ga x 36 x 96	50.40	20 Ga x 48 x 96
118.12	13 Ga x 36 x 120	63.00	20 Ga x 48 x 120
157.50	13 Ga x 48 x 120	31.500	22 Ga x 36 x 96
65.6	14 Ga x 30 x 96	39.375	22 Ga x 36 x 120
82.036	14 Ga x 30 x 120	52.500	22 Ga x 48 x 120
78.755	14 Ga x 36 x 96	21.000	24 Ga x 30 x 96
98.444	14 Ga x 36 x 120	25.200	24 Ga x 36 x 96
114.85	14 Ga x 42 x 120	31.500	24 Ga x 36 x 120
105.1	14 Ga x 48 x 96	33.600	24 Ga x 48 x 96
131.26	14 Ga x 48 x 120	42.000	24 Ga x 48 x 120
63.000	16 Ga x 36 x 96	18.900	26 Ga x 36 x 96
78.750	16 Ga x 36 x 120	23.625	26 Ga x 36 x 120
105.00	16 Ga x 48 x 120		

#3 Finish

177.19	10 Ga x 36 x 120	103.76	12 Ga x 48 x 120
236.26	10 Ga x 48 x 120	65.6	14 Ga x 30 x 96
110.25	12 Ga x 36 x 96	82.036	14 Ga x 30 x 120
137.82	12 Ga x 36 x 120	78.755	14 Ga x 36 x 96
160.79	12 Ga x 42 x 120	98.444	14 Ga x 36 x 120
147.01	12 Ga x 48 x 96	91.8	14 Ga x 42 x 96

REZISTAL 302 STAINLESS STEEL — *Continued*

SHEETS—*Continued*

#3 Finish—*Continued*

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
114.85	14 Ga x 42 x 120	63.00	18 Ga x 36 x 120
105.1	14 Ga x 48 x 96	73.50	18 Ga x 42 x 120
131.26	14 Ga x 48 x 120	67.50	18 Ga x 48 x 96
52.6	16 Ga x 30 x 96	84.00	18 Ga x 48 x 120
65.625	16 Ga x 30 x 120	37.80	20 Ga x 36 x 96
63.000	16 Ga x 36 x 96	47.25	20 Ga x 36 x 120
78.750	16 Ga x 36 x 120	63.00	20 Ga x 48 x 120
91.875	16 Ga x 42 x 120	31.500	22 Ga x 36 x 96
84.000	16 Ga x 48 x 96	39.375	22 Ga x 36 x 120
105.00	16 Ga x 48 x 120	52.500	22 Ga x 48 x 120
42.00	18 Ga x 30 x 96	25.200	24 Ga x 36 x 96
52.50	18 Ga x 30 x 120	31.50	24 Ga x 36 x 120
50.40	18 Ga x 36 x 96		

#4 Finish

126.00	11 Ga x 36 x 96	131.5	16 Ga x 60 x 120
157.50	11 Ga x 36 x 120	42.00	18 Ga x 30 x 96
184.0	11 Ga x 42 x 120	52.50	18 Ga x 30 x 120
210.00	11 Ga x 48 x 120	50.40	18 Ga x 36 x 96
110.25	12 Ga x 36 x 96	63.00	18 Ga x 36 x 120
137.82	12 Ga x 36 x 120	67.50	18 Ga x 48 x 96
160.79	12 Ga x 42 x 120	84.00	18 Ga x 48 x 120
183.76	12 Ga x 48 x 120	31.6	20 Ga x 30 x 96
128.63	12 Ga x 42 x 96	39.375	20 Ga x 30 x 120
270.0	12 Ga x 60 x 144	37.80	20 Ga x 36 x 96
78.755	14 Ga x 36 x 96	47.25	20 Ga x 36 x 120
98.444	14 Ga x 36 x 120	50.40	20 Ga x 48 x 96
105.1	14 Ga x 48 x 96	63.00	20 Ga x 48 x 120
131.26	14 Ga x 48 x 120	26.250	22 Ga x 30 x 96
147.6	14 Ga x 54 x 120	32.812	22 Ga x 30 x 120
164.0	14 Ga x 60 x 120	31.500	22 Ga x 36 x 96
196.8	14 Ga x 60 x 144	39.375	22 Ga x 36 x 120
65.625	16 Ga x 30 x 120	42.000	22 Ga x 48 x 96
63.000	16 Ga x 36 x 96	52.500	22 Ga x 48 x 120
78.750	16 Ga x 36 x 120	21.000	24 Ga x 30 x 96
73.500	16 Ga x 42 x 96	26.250	24 Ga x 30 x 120
91.875	16 Ga x 42 x 120	25.200	24 Ga x 36 x 96
105.00	16 Ga x 48 x 120	31.500	24 Ga x 36 x 120

REZISTAL 302 STAINLESS STEEL—*Continued*

SHEETS—*Continued*

#4 Finish—*Continued*

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
33.600	24 Ga x 48 x 96	18.900	26 Ga x 36 x 96
42.000	24 Ga x 48 x 120	19.688	26 Ga x 30 x 120
15.750	26 Ga x 30 x 96	23.625	26 Ga x 36 x 120

#2D Finish

118.0	13 Ga x 36 x 120	47.25	20 Ga x 36 x 120
78.750	16 Ga x 36 x 120	31.500	24 Ga x 36 x 120
63.00	18 Ga x 36 x 120	27.569	25 Ga x 36 x 120

BILLETS
R.C. Square

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
54.40	4	341.33	10
122.4	6		

WIRE COILS
Stainless, Medium, Hard, Cold Drawn, Bright

.080 Dia.	.105 Dia.	.135 Dia.
.092 "	.120 "	3/16 "

Cold Drawn Annealed Coils

1/8 Rd.	3/16 Rd.	1/4 Rd.	5/16 Rd.

STAINLESS WIRE
Condition A, Spec. QQ-W-423-5 lbs. Spools

.020	.025	.032	.041	.047

REZISTAL 302 STAINLESS STEEL—*Continued*

STAINLESS WIRE COILS

Condition B, Spec. QQ-W-423

.010	.029	.062	.135	.192
.012	.041	.072	.148	.207
.018	.045	.080	.156	.225
.022	.047	.091	.162	.243
.024	.051	.105	.177	.250
.026	.054	.120	.187	

REZISTAL 303 STAINLESS STEEL

Carbon 0.15% max. **Manganese 2.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.07% min.** **Chromium 17.00/19.00%**
Nickel 8.00/10.00% **Molybdenum 0.60% max.**

Rezistal 303 is a non-hardenable austenitic chromium-nickel steel to which elements have been added to improve machinability and non-galling characteristics. This grade is non-magnetic in the annealed condition but is slightly magnetic when cold worked. For applications where slightly higher transverse properties are desired and slightly lower machinability is acceptable, a selenium bearing modification can be supplied.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.023	3/32 CD	.316	11/32 CD
.042	1/8 CD	.376	3/8 CD
.042	1/8 CG	.376	3/8 CG
.042	1/8 CG Pol.	.376	3/8 CG Pol.
.065	5/32 CD	.441	13/32 CD
.094	3/16 CD	.511	7/16 CD
.094	3/16 CG	.511	7/16 CG Pol.
.128	7/32 CD	.587	15/32 CD
.167	1/4 CD	.675	1/2 CG
.167	1/4 CG	.668	1/2 CG Pol.
.167	1/4 CG Pol.	.754	17/32 CG
.211	9/32 CD	.845	9/16 CG
.261	5/16 CD	1.043	5/8 CG
.261	5/16 CG	1.043	5/8 CG Pol.
.300	.335 CD	1.262	11/16 CG

REZISTAL 303 STAINLESS STEEL — *Continued*

ROUNDS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
1.502	3/4 CG	10.68	2 CG Pol.
1.502	3/4 CG Pol.	12.06	2 1/8 CG
1.763	13/16 CG	12.06	2 1/8 CG Pol.
2.045	7/8 CG	12.78	2 3/16 CG
2.045	7/8 CG Pol.	12.78	2 3/16 CG Pol.
2.347	15/16 CG	13.52	2 1/4 CG
2.670	1 CG	13.52	2 1/4 CG Pol.
2.670	1 CG Pol.	15.06	2 3/8 CG
3.015	1 1/16 CG	16.69	2 1/2 CG
3.380	1 1/8 CG	16.69	2 1/2 CG Pol.
3.380	1 1/8 CG Pol.	18.40	2 5/8 CG
3.766	1 3/16 CG	19.20	2 11/16 CG
3.766	1 3/16 CG Pol.	19.20	2 11/16 CG Pol.
4.172	1 1/4 CG	20.19	2 3/4 CG
4.172	1 1/4 CG Pol.	20.19	2 3/4 CG Pol.
4.600	1 5/16 CG	22.07	2 7/8 CG
4.600	1 5/16 CG Pol.	23.04	2 15/16 CG Pol.
5.049	1 3/8 CG	24.03	3 CG
5.049	1 3/8 CG Pol.	24.03	3 CG Pol.
5.518	1 7/16 CG	20.08	3 1/8 CG
5.518	1 7/16 CG Pol.	28.21	3 1/4 CG
6.008	1 1/2 CG	32.71	3 1/2 CG
6.008	1 1/2 CG Pol.	32.71	3 1/2 RT
6.519	1 9/16 CG	32.71	3 1/2 CG Pol.
7.051	1 5/8 CG	42.73	4 CG
7.051	1 5/8 CG Pol.	48.23	4 1/4 ST
7.604	1 11/16 CG	54.08	4 1/2 ST
7.604	1 11/16 CG Pol.	57.12	4 5/8 ST
8.178	1 3/4 CG	57.12	4 5/8 CG
8.178	1 3/4 CG Pol.	60.25	4 3/4 ST
8.773	1 13/16 CG	60.25	4 3/4 CG
9.388	1 7/8 CG	66.76	5 RT
9.388	1 7/8 HR AP	66.76	5 ST
10.02	1 15/16 CG	73.600	5 1/4 ST
10.02	1 15/16 CG Pol.	80.78	5 1/2 ST
10.68	2 CD	96.13	6 ST
10.68	2 CG		

REZISTAL 303 STAINLESS STEEL—*Continued*

SQUARES

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.123	3/16 CD	1.913	3/4 CD
.213	1/4 CD	2.603	7/8 CD
.332	5/16 CD	3.400	1 CD
.478	3/8 CD	5.313	1 1/4 CD
.651	7/16 CD	7.650	1 1/2 CD
.850	1/2 CD	10.23	1 3/4 CD
1.075	9/16 CD	13.60	2 CD
1.328	5/8 CD		

BILLETS

R.C. Square

54.40	4	219.9	8
122.4	6		

HEXAGONS

.104	3/16 CD	3.324	1 1/16 CD
.184	1/4 CD	3.727	1 1/8 CD
.288	5/16 CD	4.601	1 1/4 CD
.414	3/8 CD	5.072	1 5/16 CD
.564	7/16 CD	5.567	1 3/8 CD
.736	1/2 CD	6.625	1 1/2 CD
.932	9/16 CD	7.775	1 3/8 CD
1.150	5/8 CD	9.018	1 3/4 CD
1.392	11/16 CD	10.35	1 7/8 CD
1.656	3/4 CD	11.95	2 CD
1.944	13/16 CD	13.30	2 1/8 CD
2.254	7/8 CD	14.91	2 1/4 CD
2.588	15/16 CD	16.61	2 3/8 CD
2.945	1 CD	18.404	2 1/2 CD

REZISTAL 304 STAINLESS STEEL

Carbon 0.08% max. **Manganese 2.00% max.** **Silicon 1.00% max.**
Phosphorus 0.045% max. **Sulphur 0.03% max.** **Chromium 18.00/20.00%**
Nickel 8.00/12.00%

Rezistal 304 is a non-hardenable austenitic low carbon chromium nickel steel which is a general purpose corrosion resisting steel. This grade is non-magnetic in the annealed condition, but is slightly magnetic when cold worked.

SHEETS

#2D Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
252.00	11 Ga x 48 x 144	43.319	21 Ga x 36 x 120
55.125	19 Ga x 36 x 120	39.375	22 Ga x 36 x 120

#2B Finish

288.76	8 Ga x 48 x 120	105.1	14 Ga x 48 x 96
210.0	9 Ga x 48 x 96	131.36	14 Ga x 48 x 120
262.50	9 Ga x 48 x 120	157.4	14 Ga x 48 x 144
147.66	10 Ga x 30 x 120	164.07	14 Ga x 60 x 120
141.76	10 Ga x 36 x 96	196.8	14 Ga x 60 x 144
177.19	10 Ga x 36 x 120	65.625	16 Ga x 30 x 120
189.01	10 Ga x 48 x 96	63.000	16 Ga x 36 x 96
236.26	10 Ga x 48 x 120	78.750	16 Ga x 36 x 120
126.00	11 Ga x 36 x 96	91.875	16 Ga x 42 x 120
157.50	11 Ga x 36 x 120	84.000	16 Ga x 48 x 96
168.00	11 Ga x 48 x 96	105.00	16 Ga x 48 x 120
210.00	11 Ga x 48 x 120	126.2	16 Ga x 48 x 144
262.50	11 Ga x 60 x 120	157.50	16 Ga x 60 x 144
315.00	11 Ga x 60 x 144	42.00	18 Ga x 30 x 96
114.85	12 Ga x 30 x 120	52.50	18 Ga x 30 x 120
110.25	12 Ga x 36 x 96	50.40	18 Ga x 36 x 96
137.82	12 Ga x 36 x 120	63.00	18 Ga x 36 x 120
160.79	12 Ga x 42 x 120	73.50	18 Ga x 42 x 120
147.01	12 Ga x 48 x 96	67.50	18 Ga x 48 x 96
183.76	12 Ga x 48 x 120	84.00	18 Ga x 48 x 120
229.70	12 Ga x 60 x 120	100.8	18 Ga x 48 x 144
94.500	13 Ga x 36 x 96	31.50	20 Ga x 30 x 96
118.12	13 Ga x 36 x 120	39.375	20 Ga x 30 x 120
137.81	13 Ga x 42 x 120	37.80	20 Ga x 36 x 96
157.50	13 Ga x 48 x 120	47.25	20 Ga x 36 x 120
65.629	14 Ga x 30 x 96	50.40	20 Ga x 48 x 96
82.036	14 Ga x 30 x 120	63.00	20 Ga x 48 x 120
78.755	14 Ga x 36 x 96	75.8	20 Ga x 48 x 144
98.444	14 Ga x 36 x 120	26.250	22 Ga x 30 x 96
114.85	14 Ga x 42 x 120	38.812	22 Ga x 30 x 120

REZISTAL 304 STAINLESS STEEL—*Continued*

SHEETS—*Continued*

#2B Finish—*Continued*

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
31.500	22 Ga x 36 x 96	31.500	24 Ga x 36 x 120
39.375	22 Ga x 36 x 120	33.600	24 Ga x 48 x 96
36.750	22 Ga x 42 x 96	42.000	24 Ga x 48 x 120
52.500	22 Ga x 48 x 120	15.750	26 Ga x 30 x 96
21.00	24 Ga x 30 x 96	18.900	26 Ga x 36 x 96
26.250	24 Ga x 30 x 120	19.688	26 Ga x 30 x 120
25.200	24 Ga x 36 x 96	23.625	26 Ga x 36 x 120

#3 Finish

183.76	12 Ga x 48 x 120	63.00	18 Ga x 36 x 120
98.444	14 Ga x 36 x 120	47.25	20 Ga x 36 x 120
131.36	14 Ga x 48 x 120	63.00	20 Ga x 48 x 120
78.750	16 Ga x 36 x 120	39.375	22 Ga x 36 x 120
105.00	16 Ga x 48 x 120		

#4 Finish

177.19	10 Ga x 36 x 120	67.50	18 Ga x 48 x 96
236.26	10 Ga x 48 x 120	84.00	18 Ga x 48 x 120
126.00	11 Ga x 36 x 96	73.50	19 Ga x 48 x 120
157.50	11 Ga x 36 x 120	31.50	20 Ga x 30 x 96
210.00	11 Ga x 48 x 120	39.375	20 Ga x 30 x 120
110.25	12 Ga x 36 x 96	37.80	20 Ga x 36 x 96
137.82	12 Ga x 36 x 120	47.25	20 Ga x 36 x 120
183.76	12 Ga x 48 x 120	50.40	20 Ga x 48 x 96
78.755	14 Ga x 36 x 96	63.00	20 Ga x 48 x 120
98.444	14 Ga x 36 x 120	31.500	22 Ga x 36 x 96
105.1	14 Ga x 48 x 96	39.375	22 Ga x 36 x 120
131.26	14 Ga x 48 x 120	52.500	22 Ga x 48 x 120
65.625	16 Ga x 30 x 120	26.250	24 Ga x 30 x 120
63.000	16 Ga x 36 x 96	25.200	24 Ga x 36 x 96
78.750	16 Ga x 36 x 120	31.500	24 Ga x 36 x 120
105.00	16 Ga x 48 x 120	33.600	24 Ga x 48 x 96
52.50	18 Ga x 30 x 120	42.000	24 Ga x 48 x 120
50.40	18 Ga x 36 x 96	18.900	26 Ga x 36 x 96
63.00	18 Ga x 36 x 120	23.625	26 Ga x 36 x 120

REZISTAL 304 STAINLESS STEEL—*Continued*

PLATES
#1 Finish

3/16 x 36 x 120	1/4 x 36 x 120
3/16 x 48 x 120	1/4 x 48 x 120
1/4 x 36 x 96	

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.095	3/16 CD	3.766	1 3/16 CD
.169	1/4 CD	4.218	1 1/4 CG
.213	9/32 CD	4.600	1 5/16 CG
.264	5/16 CD	5.105	1 3/8 CG
.319	11/32 CD	5.579	1 7/16 CG
.380	3/8 CD	6.074	1 1/2 CG
.446	13/32 CD	6.519	1 9/16 CG
.517	7/16 CD	7.129	1 5/8 CG
.517	7/16 HR AP	8.268	1 3/4 CG
.593	15/32 CD	8.773	1 13/16 CG
.668	.496 HR N	9.491	1 7/8 CG
.675	1/2 CG	10.80	2 CG
.854	9/16 CG	12.19	2 1/8 CG
1.00	.620 HR N	13.67	2 1/4 CG
1.054	5/8 CG	15.23	2 3/8 CG
1.262	11/16 CG	16.89	2 1/2 CG
1.440	.745 HR N	18.60	2 5/8 CG
1.519	3/4 CG	20.41	2 3/4 CG
1.782	13/16 CG	22.07	2 7/8 CG
2.067	7/8 CG	24.29	3 CG
2.373	15/16 CG	28.52	3 1/4 CG
2.600	.994 HR N	32.71	3 1/2 CG
2.699	1 CG	32.71	3 1/2 HR AP
3.417	1 1/8 CG	42.73	4 CG
3.766	1 3/16 CG HR		

REZISTAL 304 STAINLESS STEEL—*Continued*

SQUARES

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.859	½ HR AP	3.603	1 HR AP
1.342	⅝ HR AP	3.417	1⅛ HR
1.934	¾ HR AP	5.313	1¼ HR AP
2.603	⅞ HR	7.734	1½ HR AP

BILLETS
R.C. Square

55.00	4 HR	123.7	6 HR N
55.00	4 HR N	219.9	8 HR
123.7	6 HR		

HEXAGONS

1.162	⅝ CD	2.977	1 CD
1.674	¾ CD		

FLATS
HR AP

.161	⅛ x ⅜	2.24	3⁄16 x 3½
.215	⅛ x ½	2.578	3⁄16 x 4
.268	⅛ x ⅝	.430	¼ x ½
.321	⅛ x ¾	.537	¼ x ⅝
.376	⅛ x ⅞	.643	¼ x ¾
.430	⅛ x 1	.859	¼ x 1
.537	⅛ x 1¼	1.072	¼ x 1¼
.644	⅛ x 1½	1.294	¼ x 1½
.759	⅛ x 2	1.506	¼ x 1¾
1.072	⅛ x 2½	1.719	¼ x 2
1.294	⅛ x 3	2.143	¼ x 2½
.242	3⁄16 x ⅜	2.578	¼ x 3
.322	3⁄16 x ½	3.437	¼ x 4
.403	3⁄16 x ⅝	5.156	¼ x 6
.482	3⁄16 x ¾	.537	5⁄16 x ½
.645	3⁄16 x 1	1.072	5⁄16 x 1
.806	3⁄16 x 1¼	1.347	5⁄16 x 1¼
.968	3⁄16 x 1½	1.607	5⁄16 x 1½
1.294	3⁄16 x 2	2.143	5⁄16 x 2
1.44	3⁄16 x 2¼	2.679	5⁄16 x 2½
1.607	3⁄16 x 2½	.645	⅜ x ½
1.931	3⁄16 x 3	.968	⅜ x ¾

REZISTAL 304 STAINLESS STEEL — *Continued*

FLATS—*Continued*

HR AP

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
1.294	⅜ x 1	6.875	½ x 4
1.607	⅜ x 1¼	10.13	½ x 6
1.941	*⅜ x 1½ CD	2.143	⅝ x 1
1.941	⅜ x 1½	3.225	⅝ x 1½
2.253	⅜ x 1¾	4.297	⅝ x 2
2.578	*⅜ x 2 CD	2.578	¾ x 1
2.578	⅜ x 2	3.225	¾ x 1¼
3.225	⅜ x 2½	3.872	¾ x 1½
3.872	⅜ x 3	5.156	¾ x 2
5.156	⅜ x 4	6.450	¾ x 2½
1.289	½ x ¾	7.734	¾ x 3
1.719	½ x 1	4.297	1 x 1¼
2.143	½ x 1¼	5.156	1 x 1½
2.578	½ x 1½	6.875	1 x 2
3.013	½ x 1¾	8.594	*1 x 2½ CD
3.437	½ x 2	8.594	1 x 2½
4.297	½ x 2½	10.31	1 x 3
5.156	½ x 3		

*These sizes are Cold Drawn, Annealed and Pickled

Hot Rolled, Annealed and Pickled
(Approx. 20′ Long)

ANGLES

⅛ x ¾ x ¾	⅜ x 1½ x 1½
⅛ x 1 x 1	⅜ x 2 x 2
⅛ x 1¼ x 1¼	⅜ x 2½ x 2½
⅛ x 1½ x 1½	¼ x 1¼ x 1¼
⅛ x 2 x 2	¼ x 1½ x 1½
⅜ x 1 x 1	¼ x 2 x 2
⅜ x 1¼ x 1¼	¼ x 2½ x 2½

ROUND COILS

Stainless Metallizing Wire Annealed
Bright, Cold Drawn and Pickled

#11 Ga (B.&S.) (.091)	50# Coils	⅛ Dia. (.125)	150# Coils
⅛ Dia. (.125)	50# Coils	⅜ Dia. (.1875)	50# Coils

REZISTAL 304 STAINLESS STEEL—*Continued*

Stainless Wire Coils, Cold
Heading Quality, Copper Coated

WIRE COILS

.082	.131	.166	.221	.313
.091	.140	.169	.223	.328
.0915	.150	.184	.243	.341
.093	.155	.185	.251	.365
.105	.158	.210	.269	.366
.114	.159	.212	.278	.376
.117	.165	.213	.306	

REZISTAL 310 STAINLESS STEEL

Carbon 0.25% max. **Manganese 2.00% max.** **Silicon 1.50% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 24.00/26.00%**
Nickel 19.00/22.00%

Rezistal 310 is a non-hardenable austenitic chromium nickel steel which is one of the best of all the heat resisting steels for general purposes. This steel is non-magnetic when annealed or cold worked.

SHEETS

#1 Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
196.87	9 Ga x 36 x 120	75.2	18 Ga x 43 x 120
63.000	16 Ga x 36 x 96	67.50	18 Ga x 48 x 96
37.8	18 Ga x 36 x 72	84.00	18 Ga x 48 x 120
50.40	18 Ga x 36 x 96	27.6	19 Ga x 30 x 72
58.8	18 Ga x 42 x 96	55.125	19 Ga x 36 x 120
73.50	18 Ga x 42 x 120	64.4	19 Ga x 42 x 120

#2D Finish

196.87	9 Ga x 36 x 120	98.444	14 Ga x 36 x 120
157.50	11 Ga x 36 x 120	131.26	14 Ga x 48 x 120
210.00	11 Ga x 48 x 120	63.1	16 Ga x 36 x 96
118.12	13 Ga x 36 x 120	78.750	16 Ga x 36 x 120
157.50	13 Ga x 48 x 120	105.00	16 Ga x 48 x 120

REZISTAL 310 STAINLESS STEEL—*Continued*

SHEETS—*Continued*

#2D Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
50.40	18 Ga x 36 x 96	73.50	19 Ga x 48 x 120
63.00	18 Ga x 36 x 120	63.00	20 Ga x 48 x 120
82.2	18 Ga x 47 x 120	43.2	21 Ga x 36 x 120
84.00	18 Ga x 48 x 120	39.375	22 Ga x 36 x 120
55.125	19 Ga x 36 x 120	52.500	22 Ga x 48 x 120
58.8	19 Ga x 48 x 96	25.200	24 Ga x 36 x 96

PLATES

#1 Finish

$\frac{3}{16}$ x 36 x 120

BILLETS

R.C. Square

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
54.40	4	217.6	8
122.4	6	341.33	10

REZISTAL 314 STAINLESS STEEL

Carbon 0.25% max. **Manganese 2.00% max.** **Silicon 1.50/3.00%**
Phosphorus 0.045% max. **Sulphur 0.03% max.** **Chromium 23.00/26.00%**
Nickel 19.00/22.00%

Rezistal 314 is a non-hardenable austenitic chromium nickel steel which is the best of all the heat resisting steels for general purposes. This steel is non-magnetic when annealed or cold worked.

BILLETS

R.C. Square

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
123.7	6	219.9	8

REZISTAL 316 STAINLESS STEEL

Carbon 0.80% max. **Manganese 2.00% max.** **Silicon 1.00% max.**
Phosphorus 0.045% max. **Sulphur 0.03% max.** **Chromium 16.00/18.00%**
Nickel 10.00/14.00% **Molybdenum 2.00/3.00%**

Rezistal 316 is a non-hardenable austenitic chromium nickel steel with superior corrosion and heat resisting qualities. This grade is non-magnetic in the annealed condition and is slightly magnetic when cold worked.

For special applications, Rezistal 317 with higher molybdenum can be supplied.

SHEETS

#2D Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
210.00	11 Ga x 48 x 120	91.875	16 Ga x 42 x 120
52.6	16 Ga x 24 x 120		

#2B Finish

173.0	8 Ga x 36 x 96	105.1	14 Ga x 48 x 96
217.0	8 Ga x 36 x 120	131.26	14 Ga x 48 x 120
288.76	8 Ga x 48 x 120	196.8	14 Ga x 60 x 144
262.50	9 Ga x 48 x 120	63.00	16 Ga x 36 x 96
141.76	10 Ga x 36 x 96	78.750	16 Ga x 36 x 120
177.19	10 Ga x 36 x 120	84.000	16 Ga x 48 x 96
189.01	10 Ga x 48 x 96	105.00	16 Ga x 48 x 120
236.26	10 Ga x 48 x 120	50.40	18 Ga x 36 x 96
126.00	11 Ga x 36 x 96	63.00	18 Ga x 36 x 120
157.50	11 Ga x 36 x 120	67.50	18 Ga x 48 x 96
168.00	11 Ga x 48 x 96	84.00	18 Ga x 48 x 120
210.00	11 Ga x 48 x 120	37.80	20 Ga x 36 x 96
252.00	11 Ga x 48 x 144	47.25	20 Ga x 36 x 120
315.00	11 Ga x 60 x 144	44.2	20 Ga x 42 x 96
110.25	12 Ga x 36 x 96	63.00	20 Ga x 48 x 120
137.82	12 Ga x 36 x 120	31.500	22 Ga x 36 x 96
147.01	12 Ga x 48 x 96	39.375	22 Ga x 36 x 120
183.76	12 Ga x 48 x 120	52.500	22 Ga x 48 x 120
229.70	12 Ga x 60 x 120	25.200	24 Ga x 36 x 96
157.50	13 Ga x 48 x 120	31.500	24 Ga x 36 x 120
82.036	14 Ga x 30 x 120	18.900	26 Ga x 36 x 96
78.755	14 Ga x 36 x 96	23.625	26 Ga x 36 x 120
98.444	14 Ga x 36 x 120		

REZISTAL 316 STAINLESS STEEL — *Continued*

SHEETS—*Continued*

#4 Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
157.50	11 Ga x 36 x 120	63.00	18 Ga x 36 x 120
183.76	12 Ga x 48 x 120	47.25	20 Ga x 36 x 120
78.755	14 Ga x 36 x 96	63.00	20 Ga x 48 x 120
131.20	14 Ga x 48 x 120	39.375	22 Ga x 36 x 120
78.750	16 Ga x 36 x 120	52.500	22 Ga x 48 x 120
105.00	16 Ga x 48 x 120	42.000	24 Ga x 48 x 120
157.8	16 Ga x 60 x 144		

PLATES

3/16 x 36 x 120	3/16 x 48 x 132
3/16 x 48 x 120	1/4 x 48 x 120

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.167	1/4 CD	2.045	7/8 CG Pol.
.261	5/16 CD	2.347	15/16 CG
.261	5/16 CG Pol.	2.670	1 CG
.376	3/8 CD	3.015	1 1/16 CG
.376	3/8 CD Pol.	3.175	1 3/32 CG
.441	13/32 CD	3.380	1 1/8 CG
.511	7/16 CD	3.380	1 1/8 CG Pol.
.511	7/16 CG Pol.	3.766	1 3/16 CG
.567	15/32 CD	4.172	1 1/4 CG
.668	1/2 CG	4.600	1 5/16 CG
.754	17/32 CG	5.049	1 3/8 CG
.845	9/16 CG	5.518	1 7/16 CG
1.043	5/8 CG	6.008	1 1/2 CG
1.043	5/8 CG Pol.	6.008	1 1/2 CG Pol.
1.262	11/16 CG	7.051	1 5/8 CG
1.380	23/32 CG	7.604	1 11/16 CG
1.502	3/4 CG	8.178	1 3/4 CG
1.763	13/16 CG	9.388	1 7/8 CG
1.901	27/32 CG	10.200	1 15/16 CG
2.045	7/8 CG	10.68	2 CG

REZISTAL 316 STAINLESS STEEL—*Continued*

ROUNDS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
10.68	2 CG Pol.	20.19	2¾ CG
12.06	2⅛ CG	22.07	2⅞ CG
12.78	2⅜ CG	23.04	2 15/16 CG
13.52	2¼ CG	24.03	3 CG
14.28	2⅝ CG	26.08	3⅛ CG
15.06	2⅜ CG	28.21	3¼ CG
16.69	2½ CG	32.71	3½ CG
18.40	2⅝ CG	66.76	5 ST

BILLETS
R.C. Square

54.40	4	122.4	6
85.00	5	217.6	8

HEXAGONS
CD

.564	7/16	3.727	1⅛
.736	½	4.601	1¼
.932	9/16	5.072	1 5/16
1.150	⅝	5.567	1⅜
1.392	11/16	6.625	1½
1.656	¾	7.189	1 9/16
1.944	13/16	9.018	1¾
2.254	⅞	11.95	2
2.945	1	14.91	2¼
3.324	1 1/16	18.40	2½

FLATS
HR AP

.213	⅛ x ½	.957	3/16 x 1½
.319	⅛ x ¾	1.280	3/16 x 2
.425	⅛ x 1	1.590	3/16 x 2½
.638	⅛ x 1½	1.910	3/16 x 3
.850	⅛ x 2	2.230	3/16 x 3½
1.060	⅛ x 2½	2.550	3/16 x 4
1.280	⅛ x 3	.425	¼ x ½
.319	3/16 x ½	.636	¼ x ¾
.638	3/16 x 1	.850	¼ x 1
.797	3/16 x 1¼	1.06	¼ x 1¼

REZISTAL 316 STAINLESS STEEL — *Continued*

FLATS—*Continued*
HR AP

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
1.280	¼ x 1½	6.380	⅜ x 5
1.700	¼ x 2	1.700	½ x 1
2.120	¼ x 2½	2.550	½ x 1½
2.550	¼ x 3	3.400	½ x 2
3.400	¼ x 4	4.250	½ x 2½
.957	⅜ x ¾	5.100	½ x 3
1.280	⅜ x 1	6.800	½ x 4
1.920	⅜ x 1½	3.830	¾ x 1½
2.550	⅜ x 2	5.100	¾ x 2
3.190	⅜ x 2½	6.380	¾ x 2½
3.830	⅜ x 3	7.650	¾ x 3
5.100	⅜ x 4		

STAINLESS WIRE COILS

Condition B, Spec. QQ-W-423

.047	.081	.120	.130
.063	.091	.125	

REZISTAL 321 STAINLESS STEEL

Carbon 0.08% max. **Manganese 2.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 17.00/19.00%**
Nickel 8.00/11.00% **Titanium 5 x C min.**

Rezistal 321 is a non-hardenable austenitic chromium-nickel steel which is particularly adaptable for use at temperatures between 800 and 1650 F. This grade is non-magnetic in the annealed condition but is slightly magnetic when cold worked.

SHEETS

#1 Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
94.500	13 Ga x 36 x 96	31.500	22 Ga x 36 x 96
25.3	18 Ga x 29 x 60		

REZISTAL 321 STAINLESS STEEL—*Continued*

#2D Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
157.0	9 Ga x 36 x 96	105.00	16 Ga x 48 x 120
196.87	9 Ga x 36 x 120	63.00	18 Ga x 36 x 120
177.19	10 Ga x 36 x 120	84.00	18 Ga x 48 x 120
236.26	10 Ga x 48 x 120	55.125	19 Ga x 36 x 120
126.00	11 Ga x 36 x 96	58.8	19 Ga x 48 x 96
157.50	11 Ga x 36 x 120	73.50	19 Ga x 48 x 120
210.00	11 Ga x 48 x 120	37.80	20 Ga x 36 x 96
137.82	12 Ga x 36 x 120	47.25	20 Ga x 36 x 120
183.76	12 Ga x 48 x 120	63.00	20 Ga x 48 x 120
118.12	13 Ga x 36 x 120	43.2	21 Ga x 36 x 120
157.50	13 Ga x 48 x 120	39.375	22 Ga x 36 x 120
98.444	14 Ga x 36 x 120	52.500	22 Ga x 48 x 120
131.26	14 Ga x 48 x 120	31.500	24 Ga x 36 x 120
78.750	16 Ga x 36 x 120	27.569	25 Ga x 36 x 120
84.000	16 Ga x 48 x 96		

#1 Finish

PLATES

3/16 x 36 x 96	1/4 x 36 x 120
3/16 x 36 x 120	5/16 x 36 x 120

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.167	1/4 CD	2.670	1 CG
.261	5/16 CD	3.015	1 1/16 CG
.376	3/8 CD	3.380	1 1/8 CG
.511	7/16 CD	3.766	1 3/16 CD
.668	1/2 CG	3.766	1 3/16 CG
.845	9/16 CG	4.600	1 1/4 CG
1.043	5/8 CG	5.049	1 3/8 CG
1.241	11/16 CG	6.008	1 1/2 CG
1.502	3/4 CG	7.051	1 5/8 CG
1.600	49/64 CG	8.178	1 3/4 CG
1.763	13/16 CG	9.388	1 7/8 CG
2.045	7/8 CG	10.68	2 CG

REZISTAL 321 STAINLESS STEEL — *Continued*

ROUNDS — *Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
12.06	2⅛ CG	20.19	2¾ CG
13.52	2¼ CG	24.03	3 CG
15.060	2⅜ CG	37.550	3¾ HR AP
16.69	2½ CG	42.730	4 HR AP
18.40	2⅝ CG		

BILLETS
R.C. Square

54.40	4	217.6	8
54.40	4 N	217.6	8 N
122.4	6	341.33	10 N
122.4	6 N		

HEXAGONS
CD

.414	⅜	2.254	⅞
.564	7/16	2.588	15/16
.736	½	2.945	1
.932	9/16	3.727	1⅛
1.150	⅝	4.601	1¼
1.392	11/16	5.567	1⅜
1.656	¾	6.085	1 7/16
1.944	13/16	6.625	1½

FLATS
HR AP

.425	¼ x ½	2.130	⅝ x 1
.850	¼ x 1	1.28	¾ x ½
1.700	¼ x 2	2.550	¾ x 1
.645	⅜ x ½	3.830	¾ x 1½
1.289	½ x ¾	5.100	¾ x 2
1.700	½ x 1	5.100	1 x 1½
2.550	½ x 1½	.960	1½ x ¼
1.594	⅝ x ¾		

REZISTAL 325 STAINLESS STEEL

Carbon 0.25/0.50% **Manganese 2.00% max.** **Silicon 1.60/1.75% max.**
Phosphorus 0.045% max. **Sulphur 0.03% max.** **Chromium 7.00/10.00%**
Nickel 19.50/23.50% **Copper 1.00/1.50%**

Rezistal 325 is a non-hardenable austenitic chromium-nickel steel which has superior corrosion resisting qualities for certain specific applications. This grade is non-magnetic in the annealed condition and is slightly magnetic when cold worked.

For special applications, a copper-free modification of Rezistal 325 can be supplied.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
3.417	1⅛ CG	6.074	1½ CG Pol.
4.218	1¼ CG	7.051	1⅝ CG
4.218	1¼ CG Pol.	9.388	1⅞ CG
6.074	1½ CG		

REZISTAL 347 STAINLESS STEEL

Carbon 0.08% max. **Manganese 2.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 17.00/19.00%**
Nickel 9.00/12.00% **Columbium 10 x C min.**

Rezistal 347 is a non-hardenable austenitic chromium-nickel steel which is particularly adaptable for use at temperatures between 800 and 1650 F. This grade is non-magnetic in the annealed condition but is slightly magnetic when cold worked.

SHEETS

#1 Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
63.00	16 Ga x 36 x 96	47.25	18 Ga x 36 x 120
105.00	16 Ga x 48 x 120	84.00	18 Ga x 48 x 120
42.0	18 Ga x 24 x 120	46.0	19 Ga x 30 x 120

REZISTAL 347 STAINLESS STEEL — *Continued*

SHEETS — *Continued*

#2D Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
157.50	11 Ga x 36 x 120	73.50	19 Ga x 48 x 120
94.500	13 Ga x 36 x 96	47.25	20 Ga x 36 x 120
118.12	13 Ga x 36 x 120	50.40	20 Ga x 48 x 96
98.444	14 Ga x 36 x 120	63.00	20 Ga x 48 x 120
131.26	14 Ga x 48 x 120	39.375	22 Ga x 36 x 120
78.750	16 Ga x 36 x 120	52.500	22 Ga x 48 x 120
84.000	16 Ga x 48 x 96	31.500	24 Ga x 36 x 120
50.40	18 Ga x 36 x 96	25.20	.020 Ga x 36 x 120
63.00	18 Ga x 36 x 120	33.60	.020 Ga x 48 x 120
84.00	18 Ga x 48 x 120	201.60	.016 Ga x 36 x 120
55.125	19 Ga x 36 x 120		

PLATES

#1 Finish

3/16 x 36 x 120	3/8 x 36 x 120
1/4 x 36 x 120	7/8 x 36 x 120
5/16 x 36 x 120	1 x 36 x 120

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
1.043	5/8 CG	10.68	2 CG
1.519	3/4 CG	13.67	2 1/4 CG
2.699	1 CG	42.73	4 CG
4.218	1 1/4 CG		

Rezistal Stainless Type 347 to Chemical Analysis of Spec. AMS 5680

1/16 RD. x Coils

REZISTAL 410 STAINLESS STEEL

Carbon 0.15% max. **Manganese 1.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 11.50/13.50%**

Rezistal 410 is a hardenable chromium steel which is adaptable for general purpose corrosion resisting and heat resisting applications. This grade is magnetic at all times.

SHEETS

#2D Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
154.50	13 Ga x 48 x 120	82.40	18 Ga x 48 x 120
128.76	14 Ga x 48 x 120	55.125	19 Ga x 36 x 120
63.00	16 Ga x 36 x 96	72.10	19 Ga x 48 x 120
103.00	16 Ga x 48 x 120	51.500	22 Ga x 48 x 120
63.00	18 Ga x 36 x 120	41.200	24 Ga x 48 x 120

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.257	5/16 CD A	3.323	1 1/8 HR N
.502	7/16 CD A	3.323	1 1/8 CG H
.502	7/16 HR A	4.101	1 1/4 HR AP
.539	29/64 CD A	4.101	1 1/4 CG A
.655	1/2 CG A	4.101	1 1/4 HR N
1.023	5/8 CG A	4.963	1 3/8 HR AP
1.023	5/8 HR AP	4.963	1 3/8 CG A
1.476	3/4 CG A	5.906	1 1/2 HR AP
1.476	3/4 HR AP	5.906	1 1/2 CG A
1.476	3/4 HR N	5.906	1 1/2 HT CG
2.010	7/8 CG A	6.931	1 5/8 CG A
2.010	7/8 HR N	6.931	1 5/8 HR AP
2.010	7/8 HT CG	6.931	1 5/8 HR N
2.307	15/16 HR N	6.408	1 9/16 HT CG
2.307	15/16 HT CG	8.039	1 3/4 HR AP
2.625	1 HR AP	8.039	1 3/4 CG A
2.625	1 CG A	9.228	1 7/8 CG A
2.625	1 HR N	10.50	2 HR AP
3.323	1 1/8 HR AP	10.50	2 CG A

REZISTAL 410 STAINLESS STEEL—*Continued*

ROUNDS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
10.50	2 280/310 BHN HR HT	21.69	2⅞ HR AP
13.29	2¼ HR AP	23.62	3 HR AP
13.29	2¼ CG	27.73	3¼ HR
13.29	2¼ CG HT	27.73	3¼ 280/310 BHN HR HT
16.41	2½ CG	29.90	3⅜ HT CG
16.41	2½ HR AP	31.01	3⅞₁₆ HT CG
16.41	2½ 280/310 BHN HR HT	32.15	3½ HT CG
		32.15	3½ HR AP
18.09	2⅝ HT CG	32.15	3½ 280/310 BHN HR HT
19.85	2¾ HR AP		
19.85	2¾ HT CG	36.91	3¾ HR AP
19.85	2¾ 280/310 BHN HR HT	42.00	4 HR AP

BILLETS

R.C. Square

53.48	4	120.3	6
85.00	5	213.9	8

HEXAGONS

11.95	2 HT CD

Stainless Wire Coils, Cold Heading Quality, Copper Coated

WIRE COILS

.0915	.130	.145	.158	.184
.093	.131	.148	.164	.198
.106	.132	.150	.165	.2135
.110	.133	.151	.1655	.223
.124	.140	.152	.182	.3405

REZISTAL 416 STAINLESS STEEL

Carbon 0.15% max. **Manganese 1.25% max.** **Silicon 1.00% max.**
Phosphorus .060% **Sulphur 0.15% min.** **Chromium 12.00/14.00%**
Molybdenum 0.60% max.

Rezistal 416 is a hardenable chromium steel to which elements have been added to improve the machinability and non-galling characteristics. This grade is magnetic in all conditions. For applications where slightly higher transverse properties are desired and a slightly lower machinability is acceptable, a selenium bearing modification can be supplied.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.023	3/32 CD	.657	1/2 CG
.023	3/32 CG	.657	1/2 HT CD
.041	1/8 CD	.741	17/32 CG
.064	.155 CD	.741	17/32 HT CG
.064	5/32 CD	.831	9/16 CG
.092	3/16 CD	.831	9/16 HT CD
.092	3/16 HT CD	.831	9/16 HT CG
.126	7/32 CD	1.025	5/8 CG
.126	7/32 HT CD	1.025	5/8 HT CD
.147	15/64 CD	1.025	5/8 HT CG
.164	1/4 CD	1.241	11/16 CG
.164	1/4 CG	1.241	11/16 HT CD
.164	1/4 HT CD	1.241	11/16 HT CG
.207	9/32 CD	1.357	23/32 CG
.207	9/32 HT CD	1.476	3/4 CG
.257	5/16 CD	1.476	3/4 CG Pol.
.257	5/16 CG	1.476	3/4 HT CD
.257	5/16 HT CD	1.476	3/4 HT CG
.311	11/32 CD	1.476	3/4 CG HT Pol. (10′–0 1/4″ lgths)
.311	11/32 HT CD		
.376	.3735/.375 CG	1.733	13/16 CG
.370	3/8 CG	1.733	13/16 CG HT (20′/22′ lgths)
.370	3/8 CD		
.370	3/8 HT CD	1.733	13/16 HT CD
.401	25/64 CD	1.733	13/16 HT CG
.434	13/32 CD	2.010	7/8 CG
.434	13/32 HT CD	2.010	7/8 HT CD
.502	7/16 CD	2.307	15/16 CG
.502	7/16 HT CD	2.307	15/16 CG Pol.
.567	15/32 CD	2.307	15/16 HT CG

REZISTAL 416 STAINLESS STEEL—*Continued*

ROUNDS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
2.625	1 CG	8.624	1 13/16 CG
2.625	1 CG Pol.	8.624	1 13/16 CG Pol.
2.625	1 CG HT	8.624	1 13/16 HT CD
2.964	1 1/16 CG	8.624	1 13/16 HT CG
2.964	1 1/16 CG Pol.	9.228	1 7/8 CG
2.964	1 1/16 HT CG	9.228	1 7/8 CG Pol.
3.323	1 1/8 CG	9.228	1 7/8 HT CG
3.323	1 1/8 CG Pol.	9.850	1 15/16 HT CG
3.323	1 1/8 HT CG	9.850	1 15/16 CG
3.702	1 3/16 CG	9.850	1 15/16 CG Pol.
3.702	1 3/16 CG Pol.	10.50	2 CG
3.702	1 3/16 HT CD (20/22″ lgths)	10.50	2 CG Pol.
		10.50	2 HT CG
4.101	1 1/4 CG	11.85	2 1/8 CG
4.101	1 1/4 CG Pol.	11.85	2 1/8 CG Pol.
4.101	1 1/4 HT CG	11.85	2 1/8 HT CG
4.522	1 5/16 CG	12.56	2 3/16 CG
4.522	1 5/16 CG Pol.	12.56	2 3/16 CG Pol.
4.522	1 5/16 HT CG	12.56	2 3/16 HT CG (20/22′)
4.963	1 3/8 CG		
4.963	1 3/8 CG Pol.	13.29	2 1/4 CG
4.963	1 3/8 HT CG	13.29	2 1/4 HT CG
5.424	1 7/16 CG	14.80	2 3/8 CG
5.424	1 7/16 CG Pol.	15.870	2 7/16 HT CG (20/22′)
5.424	1 7/16 HT CG		
5.900	1 1/2 CG	16.41	2 1/2 CG
5.900	1 1/2 CG Pol.	16.41	2 1/2 CG Pol.
5.900	1 1/2 HT CG	18.89	2 5/8 CG
6.408	1 9/16 CG	19.20	2 11/16 HT CG (20/22′)
6.408	1 9/16 HT CD		
6.931	1 5/8 CG	19.85	2 3/4 CG
6.931	1 5/8 CG Pol.	19.85	2 3/4 HT CG
6.931	1 5/8 HT CG	23.040	2 15/16 HT CG (20/22′)
7.475	1 11/16 CG		
7.475	1 11/16 CG Pol.	23.62	3 CG
7.475	1 11/16 HT CG	23.62	3 HT CG
7.475	1 11/16 HR	25.63	3 1/8 CG
8.039	1 3/4 CG	27.13	3 3/16 CG
8.039	1 3/4 CG Pol.	27.13	3 3/16 HT CG
8.039	1 3/4 HT CG	27.73	3 1/4 CG

REZISTAL 416 STAINLESS STEEL—*Continued*

ROUNDS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
31.550	3 7/16 HT CG	53.16	4 1/2 ST
32.15	3 1/2 CG	53.16	4 1/2 HR
34.49	3 5/8 CG	59.22	4 3/4 HR
36.91	3 3/4 CG	59.22	4 3/4 ST
36.91	3 3/4 HR	65.62	5 HR
42.00	4 CG	65.62	5 ST
42.00	4 HR	72.35	5 1/4 R T
42.00	4 HR	72.35	5 1/4 ST
47.41	4 1/4 HR	79.41	5 1/2 R T
47.41	4 1/4 CG	79.41	5 1/2 ST
47.41	4 1/4 ST	96.130	6 ST
53.16	4 1/2 CG	96.130	6 R T
53.16	4 1/2 HR	104.30	6 1/4 R T

SQUARES

.859	1/2 CD	6.318	1 3/8 CD
3.342	1 CD	7.519	1 1/2 CD
4.229	1 1/8 CD	10.23	1 3/4 CD
4.713	1 3/16 CD	13.37	2 CD

BILLETS
R. C. Square

53.55	5	213.9	8
120.3	6		

HEXAGONS

.102	3/16 HT CD	1.368	1 1/16 CD
.181	1/4 CD	1.368	1 1/16 HT CD
.283	5/16 CD	1.628	3/4 CD
.407	3/8 CD	1.628	3/4 HT CD
.407	3/8 HT CD	1.911	13/16 CD
.554	7/16 CD	1.911	13/16 HT CD
.554	7/16 HT CD	2.216	7/8 CD
.723	1/2 CD	2.544	15/16 CD
.723	1/2 HT CD	2.895	1 CD
.916	9/16 CD	2.895	1 HR
.916	9/16 HT CD	2.895	1 HT CD
1.130	5/8 CD	3.267	1 1/16 CD
1.130	5/8 HT CD	3.664	1 1/8 CD

REZISTAL 416 STAINLESS STEEL —*Continued*

HEXAGONS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
3.664	1⅛ HT CD	7.067	1 9/16 CD
4.523	1¼ CD	7.643	1⅝ CD
4.523	1¼ HT CD	8.865	1¾ CD
5.372	1⅜ CD	10.50	1⅞ CD
5.372	1⅜ HT CD	11.58	2 CD
6.512	1½ CD	14.66	2¼ CD

REZISTAL 420 STAINLESS STEEL

Carbon over 0.15% **Silicon 1.00% max.** **Sulphur 0.03% max.**
Manganese 1.00% max. **Phosphorus 0.04% max.**
Chromium 12.00/14.00%

Rezistal 420 is a hardenable chromium steel which is the general purpose cutlery grade. This grade is magnetic at all times.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
1.150	21/32 HT CG	2.307	15/16 CG
1.476	¾ CG	2.625	1 HR
1.733	13/16 HT CG	4.400	1 9/32 HT CG
2.010	⅞ HR		

BILLETS
R.C. Square

53.48	4	120.3	6

WIRE COILS

Stainless Metallizing Wire Annealed Bright, Cold Drawn and Pickled

ROUNDS

#11 Ga. (.091)	50# Coils	3/16 Dia	50# Coils
.093	50# Coils	¼ Dia	50# Coils
⅛ Dia. (.125)	50# Coils	¼ Dia. 100 to 125# Coils	

REZISTAL 420 F STAINLESS STEEL

Carbon over 0.15% **Silicon 1.00%** **Sulphur 0.28%**
Manganese 1.00% **Molybdenum 0.45%** **Phosphorus 0.04%**
Chromium 12.00/14.00%

Rezistal 420 F is a hardenable chromium steel with a higher sulphur content that increases machinability. This grade is magnetic at all times.

ROUND BARS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.164	1/4 CD	4.522	1 5/16 CG
.370	3/8 CD	4.963	1 3/8 CG
.657	1/2 CG	5.906	1 1/2 CG
1.025	5/8 CG	6.931	1 5/8 CG
1.476	3/4 CG	8.039	1 3/4 CG
1.733	13/16 CG	10.50	2 CG
2.010	7/8 CG	11.85	2 1/8 CG
2.307	15/16 CG	13.29	2 1/4 CG
2.625	1 CG	16.41	2 1/2 CG
2.964	1 1/16 CG	19.85	2 3/4 CG
3.323	1 1/8 CG	23.62	3 CG
4.101	1 1/4 CG		

CRUCIBLE 422 STAINLESS STEEL

Carbon 0.20% **Silicon 0.35%** **Chromium 13.00%**
Manganese 0.75% **Nickel 0.75%** **Vanadium 0.30%**
Tungsten 1.00% **Molybdenum 1.00%**

Crucible 422 is a hardenable stainless steel for use at temperatures approaching 1200 F. The carefully balanced composition of this steel provides unusual mechanical properties. Large sections can be heat treated without the formation of intermediate transformation products.

BILLETS
R.C. Square

53.48	4

REZISTAL 430 STAINLESS STEEL

Carbon 0.12% max. **Manganese 1.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 14.00/18.00%**

Rezistal 430 is essentially a nonhardenable chromium steel which is adaptable for general purpose corrosion and heat resisting applications. It is prone to slight hardening by heat treatment. This grade is magnetic at all times.

For those applications where superior machinability is desired and where slightly lowered corrosion resistance is satisfactory, Rezistal 430 F can be supplied.

SHEETS

#2B Finish

Est. Lbs. per Sheet	*Size*	*Est. Lbs. per Sheet*	*Size*
77.255	14 Ga x 36 x 96	37.80	20 Ga x 36 x 96
96.569	14 Ga x 36 x 120	47.25	20 Ga x 36 x 120
61.800	16 Ga x 36 x 96	61.80	20 Ga x 48 x 120
77.250	16 Ga x 36 x 120	31.500	22 Ga x 36 x 96
49.49	18 Ga x 36 x 96	24.720	24 Ga x 36 x 96
63.00	18 Ga x 36 x 120	18.900	26 Ga x 36 x 96

#4 Finish

115.87	13 Ga x 36 x 120	30.900	22 Ga x 48 x 96
37.09	20 Ga x 36 x 96	51.500	22 Ga x 48 x 120

ROUND BARS

.657	½ CD

STAINLESS WIRE COILS
Cold Hardening Quality, Copper Coated

.091	.117	.150	.165	.211
.0915	.118	.152	.169	.212
.093	.119	.155	.179	.221
.105	.131	.156	.183	.222
.109	.133	.158	.184	.271
.111	.138	.159	.185	.278
.113	.140	.164	.210	.306
.114	.145			

REZISTAL 431 STAINLESS STEEL

Carbon 0.20% max. **Manganese 1.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 15.00/17.00%**
Nickel 1.25/2.50%

Rezistal 431 is a hardenable nickel bearing chromium steel with superior corrosion resistance. This grade is magnetic at all times.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.092	3/16 CD	9.228	1 7/8 CG
.164	1/4 CD	10.50	2 CG
.257	5/16 CD	13.29	2 1/4 CG
.370	3/8 CG	16.41	2 1/2 CG
.502	7/16 CD	19.85	2 3/4 HR
.657	1/2 CG	23.62	3 HR
1.025	5/8 CG	27.73	3 1/4 HR
1.476	3/4 CD	32.15	3 1/2 HR
2.010	7/8 CG	42.00	4 HR
2.625	1 CG	53.16	4 1/2 HR
4.101	1 1/4 CG	65.62	5 HR
4.963	1 3/8 CG	79.41	5 1/2 HR
5.906	1 1/2 CG	94.49	6 HR
8.039	1 3/4 CG		

SQUARES

.470	3/8 CD	5.222	1 1/4 CD
.836	1/2 CD	7.519	1 1/2 CD
1.305	5/8 CD	10.23	1 3/4 CD
3.342	1 CD		

HEXAGONS

.283	5/16 CD	1.130	5/8 CD
.407	3/8 CD	1.628	3/4 CD
.723	1/2 CD		

FLATS
HR AP

.425	1/4 x 1/2	3.342	1/2 x 2
.9407	3/8 x 3/4	2.507	3/4 x 1
1.097	3/8 x 7/8	3.764	3/4 x 1 1/2
1.253	1/2 x 3/4	4.394	3/4 x 1 3/4
2.507	1/2 x 1 1/2	5.013	1 x 1 1/2
2.929	1/2 x 1 3/4	6.684	1 x 2

REZISTAL 440A STAINLESS STEEL

Carbon 0.60/0.75% **Manganese 1.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 16.00/18.00%**
Molybdenum 0.75% max.

Rezistal 440A is a hardenable chromium steel which is the toughest of the high chromium cutlery grades. This grade is magnetic at all times.

ROUNDS

Est. Lbs. per Ft.	*Size*
23.62	3 HR

REZISTAL 440C STAINLESS STEEL

Carbon 0.95/1.20% **Manganese 1.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03%** **Chromium 16.00/18.00%**
Molybdenum 0.75% max.

Rezistal 440C is a hardenable chromium steel which has one of the highest attainable hardnesses of the corrosion and heat resisting grades. This grade is magnetic at all times.

For those applications where superior machinability is desired and where slightly lower corrosion resistance is satisfactory, Rezistal 440 F can be supplied.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
.092	3/16 CD	1.025	5/8 CG
.164	1/4 CD	1.025	5/8 HR
.257	5/16 CD	1.241	11/16 CG
.257	5/16 HR	1.241	11/16 HR
.370	3/8 CD	1.476	3/4 HR
.370	3/8 HR	1.476	3/4 CG
.502	7/16 CD	1.733	13/16 HR
.502	7/16 HR	1.733	13/16 CG
.567	15/32 HR	2.010	7/8 CG
.657	1/2 CG	2.010	7/8 HR
.657	1/2 HR	2.307	15/16 CG
.741	17/32 HR	2.307	15/16 HR
.831	9/16 CG	2.625	1 CG
.831	9/16 HR	2.625	1 HR

REZISTAL 440C STAINLESS STEEL—*Continued*

ROUNDS—*Continued*

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
2.964	1 1/16 CG	14.04	2 5/16 CG
2.964	1 1/16 HR	14.80	2 3/8 CG
3.143	1 3/32 CG	16.41	2 1/2 CG
3.323	1 1/8 CG	18.89	2 5/8 CG
3.702	1 3/16 CG	19.85	2 3/4 CG
4.101	1 1/4 CG	19.85	2 3/4 HR
4.522	1 5/16 CG	21.69	2 7/8 CG
4.743	1 11/32 CG	21.69	2 7/8 HR
4.963	1 3/8 CG	23.62	3 CG
4.963	1 3/8 HR	23.62	3 HR
5.425	1 7/16 HR	27.73	3 1/4 HR
5.425	1 7/16 CG	27.73	3 1/4 RT
5.906	1 1/2 CG	30.42	3 3/8 HR
6.931	1 5/8 CG	32.15	3 1/2 HR
6.931	1 5/8 HR	32.15	3 1/2 CG
7.475	1 11/16 HR	32.15	3 1/2 RT
7.475	1 11/16 CG	36.91	3 3/4 HR
8.039	1 3/4 CG	36.91	3 3/4 RT
8.039	1 3/4 HR	36.91	3 3/4 CG
8.624	1 13/16 HR	42.00	4 CG
9.228	1 7/8 CG	42.00	4 HR
9.850	1 15/16 CG	42.00	4 RT
10.50	2 CG	47.41	4 1/4 HR
10.50	2 HR	47.41	4 1/4 RT
11.55	2 3/32 HR	53.16	4 1/2 CG
11.85	2 1/8 CG	53.16	4 1/2 RT
12.56	2 3/16 HR	59.22	4 3/4 RT
13.29	2 1/4 CG	65.62	5 CG
13.29	2 1/4 HR	79.41	5 1/2 RT
1.404	2 5/16 HR	94.49	6 RT

BILLETS
R.C. Square

53.48	4	213.9	8
120.3	6	341.33	10

REZISTAL 440C STAINLESS STEEL—*Continued*

WIRE COILS
Cold Heading Quality, Copper Coated

.098 .120 .140	.160 .182 .205	.235 .281	.3125 .350	.400 .440

REZISTAL 442 STAINLESS STEEL

Carbon 0.25% max. **Manganese 1.00% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 18.00/23.00%**

Rezistal 442 is a non-hardenable chromium steel which is suitable for general purpose corrosion and heat resisting applications. This grade is magnetic at all times.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
10.38	2 HR	32.15	3½ HR
23.36	3 HR	41.52	4 HR

BILLETS
R.C. Square

53.48	4

REZISTAL 446 STAINLESS STEEL

Carbon 0.20% max. **Manganese 1.50% max.** **Silicon 1.00% max.**
Phosphorus 0.04% max. **Sulphur 0.03% max.** **Chromium 23.00/27.00%**
Nitrogen 0.25% max.

Rezistal 446 is a non-hardenable chromium steel which has the highest corrosion and heat resisting properties of the straight chromium steels. This grade is magnetic at all times.

ROUNDS

Est. Lbs. per Ft.	*Size*	*Est. Lbs. per Ft.*	*Size*
5.840	1½ HR	16.22	2½ HR
10.38	2 HR	41.52	4 HR

SQUARES

13.22	2 HR	30.00	3 HR
20.66	2½ HR		

BILLETS
R.C. Square

53.48	4 HR	122.4	6 HR

Index

CONTOUR TRENTWELD

STAINLESS STEEL PIPE AND TUBING

Page 155 to Page 157

TRENT TUBE COMPANY
East Troy, Wisconsin
Subsidiary of Crucible Steel Company of America

Index

CONTOUR TRENTWELD

STAINLESS STEEL PIPE AND TUBING

Page 155 to Page 157

TRENT TUBE COMPANY
East Troy, Wisconsin
Subsidiary of Crucible Steel Company of America

PRESENTING

CONTOUR TRENTWELD

TRENT—PIONEER IN WELDED TUBING

Since it was formed nearly 15 years ago, the Trent Tube Company has led the welded tube industry in new developments to bring you better quality stainless pipe and tubing.

Trent was first, for example, to commercially produce welded tubing using a helium-gas shielded arc and nonconsumable electrode. This process, called TRENTWELD, was used exclusively by Trent for seven years, although today all welded stainless tubing is made by the inert-gas shielded method. The TRENTWELD process produces an exceptionally sound weld, free from gaseous inclusions and without contamination from extraneous metal. In fact the chemical and physical properties of TRENTWELD tubing are as good or better in the weld zone as in the body metal of the tube.

Recognizing that the uses for as-welded tubing were limited primarily to ornamental applications, Trent also led in developing and improving after-welding processing methods. Today Trent's cold working, annealing, pickling and passivating, testing, and inspection operations are unsurpassed in the welded tube industry.

Now, with Trent's new patented CONTOUR TRENTWELD process—another major and exclusively Trent development—you are assured of the highest quality stainless pipe and tubing available anywhere when you specify CONTOUR TRENTWELD.

A MAJOR DEVELOPMENT IN STAINLESS PIPE

Big news for stainless and high-alloy pipe and tubing users! It's Trent's brand-new, patented CONTOUR TRENTWELD process that brings you the true uniformity of welded pipe and tubing, *plus complete absence of weld bead or undercut.* CONTOUR TRENTWELD produces a pipe and tube so smooth, so uniform that the weld is practically imperceptible.

And it means improved physical properties . . . better finish . . . elimination of cavitation corrosion or erosion. Flared or flanged ends are smoother, too. In fact, by whatever test you choose, Trent's CONTOUR TRENTWELD pipe and tubing will outperform any other pipe or tubing.

Here's why—CONTOUR TRENTWELD makes use of all the best features of the original Trentweld process—uniform stainless or high-alloy strip . . . controlled inert-gas shielded arc welding . . . absence of any filler rod. But there's *one vital difference.* In CONTOUR TRENTWELD the weld is made at the bottom of the formed strip. Gravity works to pull down the molten weld metal until it perfectly matches the contour of the pipe.

Like most good ideas, CONTOUR TRENTWELD sounds simple. But until Trent redesigned and rebuilt their mills, no equipment had ever been made to allow continuous welding at the bottom of the pipe or tube.

Wider range of grades available—Improved physical and metallurgical properties afforded by CONTOUR TRENTWELD

make it possible to produce welded pipe and tubing in grades and sizes not readily available before in acceptable quality. Now, for example, you can get CONTOUR TRENTWELD Hastelloy, Zirconium, Zircoloy, Titanium and 19-9-DL grades.

Try Trent's new CONTOUR TRENTWELD pipe or tubing for yourself. Whether it's for corrosion or heat resistance—pressure or mechanical applications, you'll find CONTOUR TRENTWELD best. Prove it. Ask for a sample, and give it any test you like. It's the quickest way to satisfy yourself that CONTOUR TRENTWELD pipe and tubing outperforms all others. And remember, it's made by Trent—tube mill specialists.

* CONTOUR TRENTWELD is the trade mark of the Trent Tube Co. for its process of welding pipe and tubing which is protected under U. S. Patent 2,716,692.

WHY TRENT'S EXCLUSIVE *CONTOUR-TRENTWELD* PROCESS MEANS SMOOTHER WELDS...

Here's the conventional way of welding pipe. Gravity pulls some of the molten metal down into the pipe to form a bead that is extremely difficult to remove by cold working. This is particularly troublesome in heavier gages. Cold working of the inside bead can lead to undercuts, focal points for erosive and corrosive attack. Cleaning is difficult.

Trent couldn't repeal gravity, so they put gravity to work. They flopped the pipe over, and made the weld at the bottom. Gravity still pulls the molten metal down—but, in doing so, it makes the weld contour correspond to the contour of the pipe itself. That's why there's no tell-tale bulge of weld metal on the critical inside pipe surface. And, even on the outside surface, the weld contour more closely approaches that of the parent metal than any other welded pipe.

ALLOY STEELS

Index

ALLOY STEELS

Index

ALLOY STEELS

All the standard warehouse AISI and SAE alloy steels listed are produced within the AISI and SAE standard composition limits to a McQuaid-Ehn grain size of 5 to 8. All Crucible Alloy Steels are manufactured with rigid metallurgical inspection to assure highest quality and uniformity.

Metallurgical data sheets covering most of the grades listed in this section are available from your local Crucible Branch Sales Office or Warehouse.

These data sheets contain typical analysis, recommended procedures for forging, annealing and hardening, and give representative mechanical properties to be expected after these operations. Information about fabrication is also included.

COLOR MARKING for Max-el®

MAX-EL 1-B
Hot Rolled Natural

MAX-EL 2-B
Hot Rolled Natural

AISI-3120
Hot Rolled Natural

AISI-3140
Hot Rolled Annealed

TS-8620
Hot Rolled Natural

TS-8620
Cold Finished Natural

NITRIDING MODIFIED-135
Hot Rolled Heat-Treated

AISI-4140
Hot Rolled Annealed

MAX-EL 3½
Natural

TS-4140
Cold Drawn Annealed

AISI-8620
Cold Finished Natural

AISI-8620
Hot Rolled Natural

AISI-4615
Hot Rolled Natural

AISI-3140
Cold Finished Annealed

AISI-3140
Hot Rolled Heat-Treated

and Alloy Warehouse Stock

AISI-3120
Cold Finished Natural

E-4340
Hot Rolled Annealed

E-3310
Hot Rolled Annealed

MAX-EL 3½
Hot Rolled Annealed

MAX-EL 3½
Hot Rolled Heat-Treated

MAX-EL BRAKE DIE

MAX-EL 4
Hot Rolled Annealed

MAX-EL SHANK
Cold Drawn Annealed

TS-4140
Hot Rolled Annealed

AISI-4140
Hot Rolled Heat-Treated

E-4340
Hot Rolled Heat-Treated

AISI-4615
Cold Finished Natural

TS-4140
Hot Rolled Heat-Treated

AISI-4140
Cold Drawn Annealed

AISI-3140 ALLOY STEEL BARS

Average Chemistry

Carbon 0.40% **Chromium 0.65%** **Nickel 1.25%**

AISI-3140 is a medium carbon alloy steel which responds readily to simple heat treatments, offers no difficulties in the machine shop and its performance reflects the combined good effects of the two alloying elements, the nickel additions strengthening the ferritic matrix, while the chromium imparts a simultaneous improvement in the carbide structure. This grade may be hardened by water quenching, except in complicated shapes when it is advisable to employ either an interrupted water quench or an oil hardening treatment. This steel finds a wide variety of applications for both machine tool and automotive parts, such as steering knuckles and pitman arms, drive shafts, oil hardened gears, spline shafts, collets, etc. For other applications, where high strength or hardness is required, AISI-3140 oil hardened is frequently employed. These include crankshafts, rocker arms, power shovel parts, oil well tool joints, inserted tooth milling cutter bodies and similar highly stressed parts.

ROUNDS

Hot Rolled, Annealed, Machine Straightened

229 MAX. BRINELL

5/8	1 1/8	2	3	4
3/4	1 1/4	2 1/4	3 1/4	5
7/8	1 5/8	2 1/2	3 5/8	6
1	1 7/8	2 3/4	3 3/4	8

ROUNDS

Cold Finished, Annealed, Standard AISI Tolerances

241 MAX. BRINELL

5/16	5/8	15/16	1 1/4	1 5/8
7/16	3/4	1	1 3/8	1 3/4
1/2	13/16	1 1/8	1 1/2	2
9/16				

AISI-4130 AIRCRAFT QUALITY SHEET

To Specification AN-QQ-S-685 As Amended (Condition N)

Average Chemistry

Carbon 0.30% **Manganese 0.50%** **Chromium 0.95%** **Molybdenum 0.20%**

Hot Rolled, Normalized, Pickled and Oiled

THICKNESS IN INCHES CARRIED IN WAREHOUSE STOCK

.032 .049 .065	.095 .125 .156	.1875 .250 .3125	.375 .500	.750 1.000

18 Wide x 72 Long

AISI-4130 AIRCRAFT QUALITY SHEET

To Specification AMS-6350 Latest Revision

Hot Rolled, Annealed and Pickled

THICKNESS IN INCHES CARRIED IN WAREHOUSE STOCK

.043	.095	.125	.156	.1875	.250

18 Wide x 72 Long

AISI-E-3310 ALLOY STEEL BARS

Average Chemistry

Carbon 0.10% **Nickel 3.50%** **Chromium 1.60%**

AISI-E-3310, a carburizing steel with air hardening tendencies, is one of the best chromium-nickel type alloy grades for applications where exceptionally severe service conditions are expected. The high strength and toughness developed in the core, and the wear and fatigue resistance of the case of this steel make it suitable for applications requiring resistance to extreme pressure and shocks such as rear axle and transmission gears of heavy duty trucks and busses.

ROUNDS

Hot Rolled, Spheroidized Annealed, Pickled and Machine Straightened

BRINELL 229 MAX.

1¼ 1½ 1¾ 1⅞	2 2⅛ 2½	2¾ 3 3½	3⅝ 3¾ 4	4¼ 4½ 5

AISI-4140 ALLOY STEEL BARS

Average Chemistry

Carbon 0.40% **Chromium 0.95%** **Molybdenum 0.20%**

AISI-4140 is a medium carbon alloy steel with a good hardenability and having good mechanical properties at room temperature and at elevated temperatures up to 900F. This steel is usually hardened by oil quenching and is employed for such applications as bolts, studs, cylinders for aircraft engines, heavy duty gears and shafts, connecting rods, etc. It is claimed by many that AISI-4140 machines better than other alloy steels of equal strength.

ROUNDS

Hot Rolled, Annealed, Machine Straightened

229 MAX. BRINELL

1/2	1 3/8	2 1/2	3 3/4	6
5/8	1 1/2	2 5/8	4	6 1/4
3/4	1 5/8	2 3/4	4 1/4	6 1/2
13/16	1 3/4	2 7/8	4 1/2	6 3/4
7/8	1 7/8	3	4 3/4	7
1	2	3 1/8	5	7 1/4
1 1/16	2 1/8	3 1/4	5 1/4	7 1/2
1 1/8	2 1/4	3 3/8	5 1/2	7 3/4
1 1/4	2 3/8	3 1/2	5 3/4	8

ROUNDS

Cold Drawn Annealed

241 MAX. BRINELL

1/2	7/8	1 1/4	1 7/8	2 1/4
5/8	1	1 1/2	2	2 1/2
3/4	1 1/8	1 3/4		

AISI-4140 ALLOY STEEL BARS—*Continued*

ASTM A-193

Grade B7

ROUNDS

Hot Rolled, Heat Treated, Stress Relieved, and Machine Straightened

262/311 BRINELL

½	1⅜	2¼	3¼	4¾
⅝	1½	2⅜	3½	5
¾	1⅝	2½	3¾	5¼
⅞	1¾	2⅝	4	5½
1	1⅞	2¾	4¼	5¾
1⅛	2	2⅞	4½	6
1¼	2⅛	3		

AISI-E-4340 ALLOY STEEL BARS

MIL-S-5000-A

Average Chemistry

Carbon 0.40% **Nickel 1.85%** **Chromium 0.89%**
Molybdenum 0.25%

AISI-E-4340 is an alloy steel with high impact strength and anti-fatigue properties, suitable for oil hardening gears, axle shafts, diesel engine crankshafts, and heavy duty shafting over 2-inch diameter.

ROUNDS

Hot Rolled, Annealed, Pickled and Machine Straightened

229 MAX. BRINELL

⅝	1¾	3	4¼	5½
¾	2	3¼	4½	5¾
1	2¼	3½	4¾	6
1⅛	2½	3¾	5	6½
1¼	2¾	4	5¼	8
1½				

AISI-4615 ALLOY STEEL BARS

Average Chemistry

Carbon 0.15% **Nickel 1.85%** **Molybdenum 0.25%**

ROUNDS

Hot Rolled, Natural Condition, Machine Straightened

1/2	1 1/4	2 1/8	3	4 1/4
5/8	1 3/8	2 1/4	3 1/8	4 1/2
3/4	1 1/2	2 3/8	3 1/4	4 3/4
13/16	1 5/8	2 1/2	3 3/8	5
7/8	1 3/4	2 5/8	3 1/2	5 1/4
1	1 7/8	2 3/4	3 3/4	5 1/2
1 1/8	2	2 7/8	4	6

ROUNDS

Cold Finished, Natural Condition

1/2	7/8	1 1/4	1 5/8	2
5/8	1	1 3/8	1 3/4	2 1/4
3/4	1 1/8	1 1/2	1 7/8	2 1/2

AISI-8620 ALLOY STEEL BARS

Average Chemistry

Carbon 0.20% **Nickel 0.55%** **Chromium 0.50%** **Molybdenum 0.20%**

AISI-8620 is the standard triple-alloy carburizing steel. This steel develops good core properties and high case hardness and toughness. Its hardenability characteristics make this grade particularly suitable for small to medium parts, which do not require the benefit of high Nickel and Molybdenum content found in AISI-4615.

ROUNDS

Hot Rolled Natural and Machine Straightened

3/4	1 3/4	2 3/4	3 3/4	5 3/4
13/16	1 7/8	2 7/8	4	6
7/8	2	3	4 1/4	6 1/4
1	2 1/8	3 1/8	4 1/2	6 1/2
1 1/8	2 1/4	3 1/4	4 3/4	6 3/4
1 1/4	2 3/8	3 3/8	5	7
1 3/8	2 1/2	3 1/2	5 1/4	7 1/2
1 1/2	2 5/8	3 5/8	5 1/2	8
1 5/8				

AISI-8620 ALLOY STEEL BARS—*Continued*

ROUNDS

Cold Finished Natural

1/2	13/16	1 1/16	1 5/16	1 5/8
9/16	7/8	1 1/8	1 3/8	1 3/4
5/8	15/16	1 3/16	1 7/16	1 7/8
11/16	1	1 1/4	1 1/2	2
3/4				

AISI-8630 AIRCRAFT QUALITY SHEET

To Specification AMS 6355 Latest Revision

Average Chemistry

Carbon 0.30% Manganese 0.80% Nickel 0.55%

Chromium 0.50% Molybdenum 0.20%

Hot Rolled, Annealed and Pickled

THICKNESS IN INCHES CARRIED AT BRANCH WAREHOUSES

.035	.0625	.093	.125	.250
.043	.065	.095	.156	.3125
.049	.078	.109	.1875	

18 Wide x 72 Long

AISI-E-52100 ALLOY STEEL BARS

BALL AND ROLLER BEARING QUALITY

ASTM A-295-46T

Type A

Carbon 1.02% Manganese 0.35% Chromium 1.45%

ROUNDS

Hot Rolled, Spheroidized Annealed and Machine Straightened

5/8	1 1/2	2 3/8	3 1/2	5
3/4	1 5/8	2 1/2	3 3/4	5 1/4
7/8	1 3/4	2 3/4	3 7/8	5 1/2
1	1 7/8	2 7/8	4	5 3/4
1 1/8	2	3	4 1/4	6
1 1/4	2 1/8	3 1/4	4 1/2	7
1 3/8	2 1/4			

FREE MACHINING ALLOY STEEL BARS

The Max-el machinery steels listed in the following pages represent an important class of material to industry in general. They offer greater ease of machinability than can be expected from either straight carbon or alloy steel of equal hardness. Parts made from Max-el steels show minimum distortion upon heat treating with less correction necessary by grinding or other expensive methods. Please refer to further data shown on the following pages for chemistry, treatment, and applications.

MAX-EL 1B MACHINERY STEEL BARS

Average Chemistry

Carbon 0.18% **Manganese 1.00%** **Sulphur 0.08%**
Molybdenum 0.10%

Max-el 1B offers to machinery steel users a case hardening grade of excellent machining qualities, capable of high hardness response in the case plus good mechanical properties in the core with minimum distortion during heat treatment. This grade is melted to a controlled grain size of 5-8 and is more uniform than regular commercial alloy steels.

ROUNDS

Hot Rolled, Natural Condition, Machine Straightened

½	1 5/8	2 5/8	4¼	6¼
5/8	1¾	2¾	4½	6½
¾	1 7/8	2 7/8	4¾	6¾
7/8	2	3	5	7
1	2⅛	3¼	5¼	7¼
1⅛	2¼	3½	5½	7½
1¼	2⅜	3¾	5¾	7¾
1⅜	2½	4	6	8
1½				

PARTIAL LIST OF TYPICAL APPLICATIONS

Carburized

Automotive Parts	Machine Tool Parts
Camshafts	Arbors
King Pins	Ball Races
Piston Pins	Chuck Jaws
Push Rods	Clutches
Tappets	Gears
Worms	Shafts
Wrist Pins	Spindles

PARTIAL LIST OF TYPICAL APPLICATIONS — *Continued*

Other Uses

Boring Bars
Chain Links
Rivets and Pins
Die Head Bodies
Skeleton Frames
Feed Mill Hammers
Gauges—Plug, Thread
Roller Dies
Seaming Rolls
Set Screws
Sprockets
Studs
Vise Jaws

MAX-EL 2B MACHINERY STEEL BARS

Average Chemistry

Carbon 0.40% **Manganese 1.00%** **Phosphorus 0.05%**
Sulphur 0.08% **Molybdenum 0.10%**

Max-el 2B has a carbon range of 0.35 to 0.45 and otherwise is identical in composition and manufactured under the same conditions as our Max-el 1B.

This steel is generally used in the "as rolled" condition for applications where heat treatment is not required but where strength plus toughness and good machinability are important.

ROUNDS

Hot Rolled, Natural Condition, Machine Straightened

1/2	1 1/8	2 3/8	3 5/8	5 3/4
9/16	1 1/4	2 1/2	3 3/4	6
5/8	1 3/8	2 5/8	4	6 1/4
11/16	1 1/2	2 3/4	4 1/8	6 1/2
3/4	1 5/8	2 7/8	4 1/4	6 3/4
13/16	1 3/4	3	4 1/2	7
7/8	1 7/8	3 1/8	4 3/4	7 1/4
15/16	2	3 1/4	5	7 1/2
1	2 1/8	3 3/8	5 1/4	7 3/4
1 1/16	2 1/4	3 1/2	5 1/2	8

PARTIAL LIST OF TYPICAL APPLICATIONS

Equipment Parts

Machine Tool Spindles
Lead Screws
Feed Screws
Racks
Worms
Motor Shafts
Renecking Rolls in Textile Plants
Printing Press Parts
Welded Shanks on
High Speed Tools
Piston Rods on
Locomotive Boosters

PARTIAL LIST OF TYPICAL APPLICATIONS—*Continued*

Equipment Parts—*Continued*

Armature Shafts
Griffin Mill Shafts in Cement Plants
Surface Grinder Spindles
Sleeves and Sleeve Shafts
Turbine Shafts
Centrifugal Pump Shafts
Drill Press Spindles
Spring Clips
Piston Rods
Mine Car Axles
Cream Separator Spindles
Flame Hardened Parts

Rolling Mill Equipment

Crane Axles
Line Shafts
Crane Drive Shafts
Conveyor Pins and Rollers
Conveyor Rolls on Slab Turnover
Impeller Shafts

MAX-EL 3½ MACHINERY STEEL BARS

Average Chemistry

Carbon 0.50% **Manganese 1.25%** **Sulphur 0.08%**
Chromium 0.65% **Molybdenum 0.18%**

Max-el 3½ has enjoyed widespread usage by leading manufacturers throughout the country for a number of years. The addition of the molybdenum contributes toward ease in machining, with a slight improvement in the physical properties, particularly in terms of impact values.

Max-el 3½ should be specified where substantial strength, toughness, and hardness are desired. The inherent qualities of Max-el 3½ can be fully developed by heat treatment.

ROUNDS

Hot Rolled, Annealed and Machine Straightened

½	1⅛	2¼	3½	5½
9/16	1 3/16	2⅜	3⅝	5¾
⅝	1¼	2½	3¾	6
11/16	1⅜	2⅝	4	6¼
¾	1½	2¾	4⅛	6½
13/16	1⅝	2⅞	4¼	6¾
⅞	1¾	3	4½	7
15/16	1⅞	3⅛	4¾	7¼
1	2	3¼	5	7½
1 1/16	2⅛	3⅜	5¼	7¾
				8

MAX-EL 3½ MACHINERY STEEL BARS—*Continued*

PARTIAL LIST OF TYPICAL APPLICATIONS

Transportation Equipment
- Drive Shafts
- Spring Clip U-Bolts
- Motor Gears
- Connecting Rod Bolts
- Motor Studs
- Steering Knuckle Spindles
- Differential Gears
- Jack Shafts
- Transmission Gears

Excavating and Road Machinery
- Heavy Duty Shafts, Gears
- Ditch Digger Teeth
- Caterpillar Treads, Links, Pins

Draw Bench Chain, Links, Pins

Cement Mill Equipment
- Kiln Gear Shafts
- Quarry Car Axles
- Pinion Shafts

Feed Mill or Grain Crushers
- Hammers, Shafts

Machine Tools
- Tool Posts
- Tool Set Screws
- Back Gear Shafts
- Clutches
- Gears, Drive, Feed
- Arbors
- Spindles
- Pinions
- Shafts
- Boring Bars

Flame Hardened Parts
- Gears, Pinions, Arbors to be oil quenched

Logging Tools

Mine Car Axles

Oil Drilling Equipment

Oil Pumping Equipment

ROUNDS

Hot Rolled, Heat Treated, Machine Straightened and Stress Relieved

BHN 262/311

½	1 5/8	2 5/8	4	6
5/8	1¾	2¾	4¼	6¼
¾	1 7/8	2 7/8	4½	6½
7/8	2	3	4¾	7
1	2⅛	3⅛	5	7¼
1⅛	2¼	3¼	5¼	7½
1¼	2⅜	3½	5½	7¾
1⅜	2½	3¾	5¾	8
1½				

MAX-EL 3½ BRAKE DIE STEEL

Stress Relieved

BHN 229/293

SQUARES

1¾	3	4½	6
2	3½	5	8
2½	4		

FLATS

2 x ½	4½ x 1	3 x 1½	6 x 2¼
3 x ½	5 x 1	3½ x 1½	3 x 2½
4 x ½	6 x 1	4 x 1½	3½ x 2½
2 x ⅝	2 x 1¼	5 x 1½	4 x 2½
3 x ⅝	2½ x 1¼	6 x 1½	5 x 2½
4 x ⅝	3 x 1¼	3 x 2	6 x 2½
2 x ¾	3½ x 1¼	3½ x 2	8 x 2½
3 x ¾	4 x 1¼	4 x 2	4 x 3
4 x ¾	4½ x 1¼	4½ x 2	5 x 3
2 x 1	5 x 1¼	5 x 2	6 x 3
2½ x 1	6 x 1¼	6 x 2	8 x 3
3 x 1	2 x 1½	8 x 2	5 x 4
4 x 1	2½ x 1½	4 x 2¼	6 x 4

SPECIAL ALLOY STEEL BARS

HY-Tuf ALLOY STEEL

Carbon 0.25% **Silicon 1.50%** **Nickel 1.80%**
Manganese 1.30% **Molybdenum 0.40%**

HY-Tuf is a low alloy thorough hardening steel possessing extraordinary mechanical properties. This grade combines high tensile strength and good ductility with relatively high impact strength and hardness.

ROUNDS

Hot Rolled Annealed

AMS 6418

½	1¼	2	2½	3¾
⅝	1½	2⅛	2¾	4
¾	1⅝	2¼	3	4½
⅞	1¾	2⅜	3½	5
1	1⅞			

TYPICAL APPLICATIONS

Aircraft Parts
Aircraft Bolts and Studs
Automotive Parts
Hand Tools
Gears
Heavy Construction Equipment
Power Plant Equipment
Rock Drill Bit Bodies
Pneumatic Tool Parts

NITRIDING STEEL #135 MODIFIED

AMS 6470

Carbon 0.38/0.43%	Manganese 0.50/0.70%	Silicon 0.20/0.40%
Chromium 1.40/1.80%	Molybdenum 0.30/0.40%	Aluminum 0.95/1.30%

Nitriding Steel #135 Modified is a chromium-molybdenum-aluminum alloy steel designed particularly for nitriding. Its composition is such that the required microstructure for optimum nitriding is produced after heat treatment. Nitrided machined parts made from this steel have a remarkably high surface hardness of about 1000 Vickers, wear resistance, and resistance to certain types of corrosion.

ROUNDS

HOT ROLLED, HEAT TREATED TO BHN 248/293

½	1¼	2	3	4
⅝	1⅜	2⅛	3¼	4½
¾	1½	2¼	3½	4¾
⅞	1⅝	2⅜	3⅝	5
1	1¾	2½	3¾	6
1⅛	1⅞	2¾		

TYPICAL APPLICATIONS

Aircraft Engine Cylinder Barrels
Bushings
Crosshead Pins
Fuel Pump Parts
Gears
Pinions
Pinion Shafts
Piston Pins
Splines and Splineshafts
Sprockets
Valve Sleeves
Worms
Wrist Pins

ALLOY STEELS

WATER HARDENING

HOLLOW TOOL STEELS

DRILL RODS

STAINLESS

CONTOUR TRENTWELD

CRUCIBLE DRILL STEELS

Index

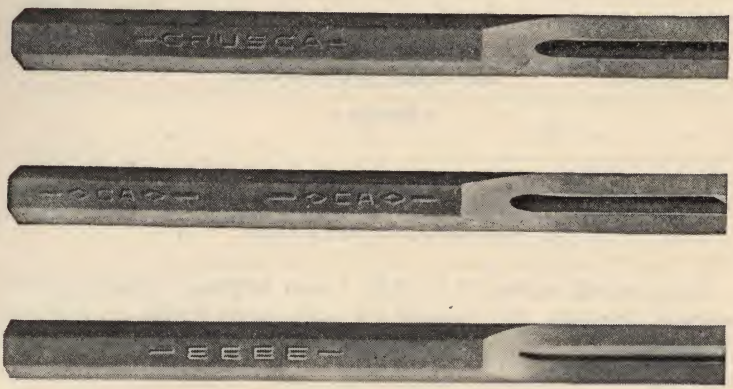
CRUCIBLE DRILL STEELS

Index

CRUCIBLE DRILL STEELS

●

HOLLOW DRILL



In mines and quarries, roads and tunnels Crucible Hollow Drill Steel is giving users *lower cost per foot drilled.* Controlled hardenability, excellence of stress-bearing surfaces and uniform processing all contribute to the assurance that Crucible Hollow Drill Steel will cut costs in your drilling operation.

You can depend upon the carbon and alloy hollow drill steels made by Crucible. Look for the trade names CRUSCA, CA DOUBLE DIAMOND and 4 E, Crucible's alloy hollow drill steels.

●

SOLID DRILL

Crucible's solid drill steels are of the same grade and high quality as its hollow drill steels.

CA DOUBLE DIAMOND ALLOY HOLLOW DRILL STEEL

Carbon 1.00% **Manganese 0.30%** **Chromium 1.35%**
Silicon 0.25% **Molybdenum 0.35%**

◆ CA ◆ Double Diamond Alloy Hollow Drill Steel is recommended for use with all types of detachable bits. Its hardness in the natural or as rolled condition is considerably higher than the straight carbon Crusca hollow drill steel, thereby giving it greater strength and resistance to fatigue. The high carbon and alloy content, moreover, gives this steel its superior resistance to wear and abrasion.

ROUNDS		
1	1⅛	1¼
QUARTER OCTAGONS		
⅞	1	
HEXAGONS		
⅞	1	

Standard mill lengths, 16 to 24 ft. Longer lengths, if required, can be supplied promptly. See page 218 for approximate weight per foot and hole size.

CRUSCA HOLLOW DRILL STEEL BARS

Carbon 0.80% **Manganese 0.30%** **Silicon 0.15%**

Crusca Hollow Drill Steel is of the straight carbon type which has been standard for hollow drill steel throughout the world for many years. Although alloy hollow drill steels have been developed and are superior, being used for many purposes, the straight carbon drill steel is the predominant, all-purpose, drill steel.

ROUNDS			
1	1⅛	1¼	1½
HEXAGONS			
⅞	1		
QUARTER OCTAGONS			
⅞	1		

Standard mill lengths, 16 to 24 ft. Longer lengths, if required, can be supplied promptly. See page 218 for approximate weight per foot and hole size.

CRUCIBLE 4E ALLOY HOLLOW DRILL ROD STEEL BARS

Carbon 0.28% **Nickel 0.30%** **Silicon 0.65%**
Manganese 1.00% **Chromium 2.15%** **Molybdenum 0.30%**

Crucible 4E Alloy Hollow Drill Rod Steel is a special analysis produced specifically for use with detachable bits. It was carefully designed to offer the mining and construction industries an improved material, relatively free from difficulties normally experienced in the field during forging and heat treating operations. Specifically, Crucible's 4E Alloy has the strength and resistance to fatigue of our CA Double Diamond Alloy Hollow Drill Steel, with a wider temperature range for forging and hardening cycles. This new grade was field tested for over a year in various mining and construction locations and has proven itself to be a very satisfactory addition to our hollow drill steel family.

ROUNDS	
1⅛	1¼

QUARTER OCTAGONS	
⅞	1

HEXAGONS	
⅞	1

CRUSCA SOLID DRILL STEEL BARS

Carbon 0.80% **Manganese 0.30%** **Silicon 0.15%**

Standard mill lengths, 16 to 24 ft. Longer lengths, if required, can be supplied promptly. See page 219 for approximate weight per foot.

HEXAGONS			
¾ ⅞	1	1⅛	1¼

OCTAGONS			
¾ ⅞	1 1⅛	1¼	1½

WELDING ELECTRODES

Index

WELDING ELECTRODES

Index

INTRODUCTION

The Crucible Steel Company of America pioneered the development of Rezistal Stainless Steels, and was one of the early companies in the development of welding rods. Crucible was instrumental in this development, from the phase of shearing pieces of strip from sheets (which served as filler rods at that time), to the present high standard of Rezistal Welding Rods and coated Electrodes.

Typical of the many contributions Crucible has made in the progress of the welding art is the popular Crucible Armorize Electrode, Type 308 Molybdenum Modified, for welding rolled and cast armor. This was solely pioneered and developed by Crucible.

The following data are dedicated to those individuals engaged in the field of welding, without whom a rapid progress in the development of welding rods, would not have been possible. These data were compiled for ready reference, to assist in the selection of the proper grade of welding rod for a given grade of Stainless Steel.

REZISTAL STAINLESS STEEL ELECTRODES

Rezistal Stainless Steel Electrodes are made of Rezistal Stainless Core Wire with an extruded coating, designed to produce a weld deposit of the following chemical and mechanical properties.

Electrode Grades	*Weld Deposit Nominal Composition Per Cent*			
	Cr	*Ni*	*C (Max.)*	*Other*
Rezistal 302B	19.00	9.00	0.15	Si 2.25
Rezistal 308	19.00	9.00	0.07	—
Rezistal 308LC	19.00	9.00	0.03	—
Rezistal 309	24.00	13.00	0.10	—
Rezistal 309Cb	24.00	13.00	0.10	Cb 1.00 max.
Rezistal 309Mo	24.00	13.00	0.10	Mo 2.00
Rezistal 310	25.00	20.00	0.15	—
Rezistal 310Cb	25.00	20.00	0.15	Cb 1.00 max.
Rezistal 310Mo	25.00	20.00	0.15	Mo 2.00
Rezistal 312	29.00	9.00	0.10	—
Rezistal 316	18.00	13.00	0.07	Mo 2.00/2.75
Rezistal 316LC	18.00	13.00	0.03	—
Rezistal 317	19.00	13.00	0.07	Mo 3.00/4.00
Rezistal 318 (316Cb)	18.00	13.00	0.07	Cb 0.75 max. Mo 2.00/2.75
Rezistal 330	15.00	35.00	0.15	—
Rezistal 347	19.00	9.00	0.07	Cb 10xC—1.00 max.
Rezistal 410	12.00	—	0.10	—
Rezistal 420	12.00	—	0.35	—
Rezistal 430	16.00	—	0.10	—
Rezistal 442	20.00	—	0.10	—
Rezistal 446	27.00	—	0.10	—
Rezistal LoCro 9Mo	9.00	—	0.10	Mo 1.00
Rezistal 502	5.00	—	0.10	Mo 0.50
Rezistal LoCro 2Mo	2.00	—	0.10	Mo 0.50
Rezistal 15-60	15.00	60.00	0.10	—
Rezistal 19-9WMo	19.00	9.00	0.13	W 1.40 CB 1.00 Mo 0.50
Rezistal 20-80	20.00	80.00	0.10	—
Rezistal WH	19.00	9.00	0.60	Mn 4.00

HIGH CARBON HEAT-

Rezistal 308 HC	19.00	9.00	.45	—
Rezistal 309 HC	24.00	13.00	.50	—
Rezistal 310 HC	25.00	20.00	.50	—
Rezistal 330 HC	15.00	35.00	.65	—
Rezistal 15-60 HC	15.00	60.00	.60	—

ELECTRODES FOR

Crucible 60	Nickel 60.00%
Crucible 99	Nickel 99.00%

ELECTRODES FOR

Armorize Mn 307

FOR AC AND DC WELDING

Note: Primary Color—At or on End of Electrode
Secondary Color—Spot or Band on Side of Electrode

*Note: Group Color—All Electrodes AC-DC Titania Coated Will Be Yellow, All DC Lime Coated Will Be Black

Mechanical Properties (min.)		*Stub End Colors**		*Electrode Grades*
Tensile Strength psi	*Elongation % in 2 in.*	*Primary*	*Secondary*	
85,000	35	Yellow	Red	Rezistal 302B
80,000	35	Yellow	—	Rezistal 308
—	—	Brown	—	Rezistal 308LC
85,000	35	Black	—	Rezistal 309
85,000	30	Black	Blue	Rezistal 309Cb
—	—	Black	White	Rezistal 309Mo
80,000	35	Red	—	Rezistal 310
—	—	Red	Blue	Rezistal 310Cb
—	—	Red	White	Rezistal 310Mo
—	—	Green	Red	Rezistal 312
85,000	30	Yellow	White	Rezistal 316
—	—	Brown	White	Rezistal 316LC
85,000	30	Yellow	Brown	Rezistal 317
—	—	Yellow	Green	Rezistal 318 (316Cb)
—	—	Green	—	Rezistal 330
85,000	30	Yellow	Blue	Rezistal 347
70,000	30	Gray	Brown	Rezistal 410
—	—	—	—	Rezistal 420
75,000	20	Gray	Green	Rezistal 430
—	—	Gray	Red	Rezistal 442
—	—	Gray	Yellow	Rezistal 446
—	—	Gray	White	Rezistal LoCro 9Mo
70,000	30	Gray	Blue	Rezistal 502
70,000	30	Gray	—	Rezistal LoCro 2Mo
—	—	Green	Blue	Rezistal 15-60
—	—	Yellow	Orange	Rezistal 19-9WMo
—	—	Green	White	Rezistal 20-80
—	—	Brown	Gray	Rezistal WH

RESISTING ELECTRODES

—	—	—	—	Rezistal 308 HC
—	—	—	—	Rezistal 309 HC
—	—	—	—	Rezistal 310 HC
—	—	Green	Black	Rezistal 330 HC
—	—	—	—	Rezistal 15-60 HC

CAST IRON WELDING

	Orange	Brown	Crucible 60
	Orange	Blue	Crucible 99

WELDING ARMOR

Armorize 308 Mo Mod

REZISTAL STAINLESS STEEL BARE WELDING WIRE

Note: The Nominal Composition of the following grades is the same as shown for Rezistal Stainless Steel Electrodes.

OXY-ACETYLENE AND INERT GAS ARC-WELDING

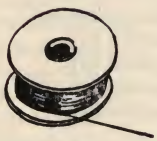
CUT LENGTHS

Rezistal 304	Rezistal 310	△Rezistal 321
Rezistal 308	Rezistal 310 CB	Rezistal 330
Rezistal 308 LC	Rezistal 316	Rezistal 347
Rezistal 309	Rezistal 316 LC	Rezistal 15-60
Rezistal 309 CB	Rezistal 318	

△For Inert Gas-Arc-Welding only.

INERT GAS ARC-WELDING WIRE

ON LAYER WOUND SPOOLS



Rezistal 308	Rezistal 310	Rezistal 318
Rezistal 308 LC	Rezistal 310 CB	*Rezistal 321
Rezistal 309	Rezistal 316	Rezistal 347
Rezistal 309 CB	Rezistal 316 LC	

*Nominal Composition Deposited.

	Cr	Ni	C	Other
Rezistal 321	19.00	900	.07 max.	(Ti 5xC min.)

SUBMERGED ARC-WELDING WIRE

LAYER WOUND COILS

Rezistal 308	Rezistal 310	Rezistal 318
Rezistal 308 LC	Rezistal 310 CB	Rezistal 420
Rezistal 309	Rezistal 316	Rezistal 347
Rezistal 309 CB	Rezistal 316 LC	

METALLIZING WIRE

LAYER WOUND COILS

Rezistal 304 308 309 310 316
†420 and Other Stainless Grades

†For Wear Resistance RC 45/55.

REZISTAL ELECTRODES—DESCRIPTIONS

REZISTAL 302 B

Rezistal 302 B is a high silicon austenitic chromium-nickel electrode for welding heat resisting steels. This grade is particularly good for resistance to scaling up to 1700 F.

REZISTAL ARMORIZE MN 307 ELECTRODES

Rezistal Armorize Mn is an austenitic electrode conforming to Government Specifications for welding rolled and cast armor steels without preheating. This grade is adaptable for welding other dissimilar grades of steels; low and medium carbon steels and manganese steels.

REZISTAL 308

Rezistal 308 is an austenitic chromium nickel electrode conforming to Government and other specifications for welding types 301, 302, 304, 305 and 308 stainless steels. This grade is free from susceptibility to intergranular corrosion in presence of weak electrolytes after welding. This grade is also adaptable for welding dissimilar grades of steels, Lo Cro Mo, Types 501, 502, Lo Cro 9 Mo, Types 403, 405, 406, 410, 430 and high manganese steels.

REZISTAL ARMORIZE 308 MO MOD.

Rezistal Armorize 308 Mo Mod. is an austenitic electrode conforming to Government Specification for welding rolled and cast armor steels without pre-heating and post-heating. This grade is adaptable for welding other dissimilar grades of steels; low and medium carbon steels, Lo Cro 2 Mo, Types 501, 502, Lo Cro 9 Mo, Types 403, 405, 406, 410 and high manganese steels.

REZISTAL 308 LC

Rezistal 308 LC is a low carbon austenitic chromium-nickel electrode conforming to Government and other specifications for welding Types 301, 302, 304, 304 LC, 305, 308, 321 and 347. This grade is essentially free from carbide precipitation due to its low carbon content.

REZISTAL 309 ELECTRODES

Rezistal 309 for welding Type 309 steel, is an austenitic chromium-nickel electrode conforming to Government and other specifications for welding heat-resisting steels. This grade has greater corrosion resistance and better resistance to scaling up to 1950 F. than the lower chromium-nickel grades. Rezistal 309 can be used for welding same grades of stainless as Rezistal 308 electrodes, including Types 302 B and 442.

REZISTAL 309 CB ELECTRODES

Rezistal 309 CB is recommended where maximum resistance to corrosion is required without subsequent annealing after welding. This grade is adaptable for welding same grades of stainless and dissimilar steels as Rezistal 309.

REZISTAL 310 ELECTRODES

Rezistal 310 for welding Type 310 steel is an austenitic chromium-nickel electrode conforming to Government and other specifications for welding general corrosion and heat-resistant steels. This grade resists scaling depending on the atmosphere up to 2100 F. and is recommended where high concentration of SO 2 gas is encountered at elevated temperatures. This grade is adaptable for welding same grades as Rezistal 309, including Types 311-314, 446 stainless, dissimilar metals, high carbon steels, air hardening steels, rolled armor, cast armor steels, high manganese and stainless clad steels.

REZISTAL 310 CB ELECTRODES

Rezistal 310 CB is recommended for welding Type 310 CB and where maximum resistance to corrosion is required without subsequent annealing after welding as in Rezistal 309 CB. This grade is adaptable for welding same grades of steel as Rezistal 310.

REZISTAL 310 MO ELECTRODES

Rezistal 310 Mo is recommended for welding where high creep strength is desired at elevated temperatures. This grade is also recommended for welding extra heavy gages of stainless steel where high stresses are encountered to the extent that regular Types 310 and 310 CB may be susceptible to cracking. This grade is adaptable for welding same grades of steel as Rezistal 310, with exception of Types 430, 442 and 446.

REZISTAL 312 ELECTRODES

Rezistal 312 is an austenitic chromium-nickel electrode conforming to Government and other specifications for welding Type 312 stainless steel and super alloy high heat-resisting steels. This grade can be used as a substitute for welding Types 301, 302, and 304. Can be used for welding Lo Cro 2 Mo, Types 501, 502 and other dissimilar steel welding, low and high carbon and high manganese steel.

REZISTAL 316 ELECTRODES

Rezistal 316 is an austenitic chromium-nickel electrode for welding Type 316 stainless steel, has excellent corrosion resistance and is used for applications in sulphate or sulphite liquors in the paper industry, textile processing and some application in chemical industries. It is also recommended where high creep strength is desired at elevated temperatures.

This grade resists scaling up to 1650 F., has high tensile strength and excellent resistance to creep at elevated temperatures.

This grade can be used for welding Types 301, 302, 302 B, 304, 305 and 317.

REZISTAL 316 LC

Rezistal 316 LC is a low carbon austenitic chromium-nickel electrode for welding Type 316 LC stainless steel. This electrode is essentially free from carbide precipitation due to its low carbon content.

It may be used for the same application as Rezistal 316. In addition it can be used to weld the same grades as a Regular Rezistal 316 electrode, including Types 308 LC, 321 and 347.

REZISTAL 317 ELECTRODES

Rezistal 317 is an austenitic chromium-nickel electrode for welding Type 317 stainless steel. Its corrosion resistance is similar to that of Rezistal 316 and is used for sulphate of sulphite liquors in the paper industry, textile processing and some application in the chemical industries. Rezistal 317 is not recommended for operating above 1300 F.

This grade may be used as a substitute for welding Types 301, 302, 304 and 305. This grade may also be used for welding Type 316 if service operation is not above 1300 F.

REZISTAL 318 ELECTRODES

Rezistal 318 is columbium stabilized (formerly 316 CB) austenitic chromium-nickel-molybdenum electrode for welding Types 316 and 318. It is recommended where maximum resistance to corrosion is required without annealing after welding. It has high creep strength at elevated temperatures and resists scaling up to 1650 F.

This grade may be used as a substitute for welding Types 301, 302, 304, 305, 316, 317 and 347.

REZISTAL 330 ELECTRODES

Rezistal 330 is an austenitic chromium-nickel electrode primarily for welding Type 330 heat-resisting steels for elevated temperature service up to 2100 F. This grade is excellent for such applications as annealing boxes, hoods, mufflers, retorts, furnace linings, etc. However, it should not be used in the presence of sulphur gases.

When welding heavy sections with Rezistal 330, it is advisable to preheat at a minimum temperature of 300 F, prior to welding and stress relieve after welding at 700 F minimum.

REZISTAL 347 ELECTRODES

Rezistal 347 is an austenitic chromium-nickel, columbium stabilized electrode, conforming to Government and other specifications for welding Type 347 stainless steel for use in strong electrolytes. Rezistal 347 is recommended where maximum resistance to corrosion is required without subsequent annealing after welding. Rezistal 347 is scale resistant up to 1650 F depending on service atmosphere. Rezistal 347 can be used for welding Types 301, 302, 304, 305, 308, Lo Cro 2 Mo, Types 501, 502, Lo Cro 9 Mo, Types 403, 405, 406, 410, 430 and high manganese steels. Rezistal 347 may be used in service application above 800 F.

REZISTAL 15-60 ELECTRODES

Rezistal 15-60 is a chromium-nickel austenitic electrode for welding Type 15-60 heat-resisting steels for elevated temperatures service similar to Rezistal 330. This grade should not be used in the presence of sulphur gases. Rezistal 15-60 can be used for welding Type 330 heat-resisting steel. It is scale resistant, depending on service application, up to 2100 F.

For heavy section welding it is advisable that the same pre-heat and stress-relief be used as for Type 330.

REZISTAL 19-9 WMO

Rezistal 19-9 WMo is an austenitic chromium-nickel tungsten molybdenum electrode for welding Types 19-9 WMo, 19-9 DL, 16-25-6 and S 816. It is suitable for elevated temperature operations where high creep strengths are required.

REZISTAL 20-80 ELECTRODES

Rezistal 20-80 is an austenitic chromium-nickel electrode for welding Type 20-80 heat-resisting steels. This grade should not be used in the presence of sulphur gases. Rezistal 20-80 can be used for welding Types 330 and 16-65. Depending on the nature of the design and thickness of the structure to be welded, care must be exercised in welding, since this grade is somewhat prone to cracking. Parent metal should be pre-heated prior to welding and stress relieved at 700 F maximum. This grade is scale resistant up to 2200 F.

REZISTAL WH ELECTRODES

Rezistal WH is an austenitic chromium-nickel-manganese type electrode for welding high manganese steel, dissimilar steels and low and medium carbon steels. Excellent for resistance to heavy impact shock service, as for example, steel mill rolls, wabblers, coupling boxes, drivers, railroad tracks, cross-overs, frogs, switchjoints, etc.

It is recommended as an underlay metal prior to hard surfacing of other harder compositions. Hardness of WH, as deposited is around 200 BHN, will work harden under impact to 500 BHN.

REZISTAL 410 ELECTRODES

Rezistal 410 is a hardenable martensitic straight chromium electrode for welding Type 410. Rezistal 410 is corrosion resistant to atmosphere, fresh water, mild acids and alkalies. It is scale resistant, depending upon the atmosphere, up to 1200 F. Rezistal 410 is susceptible to cracking and air hardening unless pre-heated to a minimum temperature of 300 F prior to welding and post-heated directly after welding by low annealing at 1250 to 1400 F and air cooled or full annealing at 1500 to 1650 F then furnace cooling at a rate of 50 to 100 F per hour to 1100 and air cooled. This grade may be used as a substitute for welding Lo Cro 9 Mo, Lo Cro 2 Mo, Type 501 and 502.

Where it is not feasible to employ heat treatment, one of the austenitic grades may be used, viz: Rezistal 308, 308 LC, 309, 309 CB, 310, 310 CB and 347.

REZISTAL 420 ELECTRODES

Rezistal 420 is a hardenable martensitic straight chromium electrode for welding Type 420 steel. This material is corrosion resistant in mild acids and alkalies. It is a scale resistant depending upon the atmosphere up to 1200 F.

Rezistal 420 is susceptible to cracking and air hardening unless pre-heated to a minimum of 300 F prior to welding and post-heated directly after welding by low annealing at approximately 1300 F. Hold for 4 hours, air cool or fully anneal at 1500 to 1650 and furnace cool at a rate of 50 F per hour to 1100 F and air cool. Rezistal 420 has high hardening qualities due to the increased carbon content.

Where heat treatment is not feasible, one of the austenitic grades may be used; Rezistal 308, 309, 310, and 308 LC and 347.

Rezistal 420 is also a very popular grade for applications as an "overlay" deposit for wear resistance purposes, used with fusion welding and metal spraying processes.

REZISTAL 430 ELECTRODES

Rezistal 430 is a non-hardenable ferritic straight chromium electrode for welding Type 430 and for use where corrosion to nitric acid, fresh water, mild acids and alkalies is required. This grade is scale resistant depending upon the atmosphere up to 1650 F. When welding with Rezistal 430, a pre-heat at 300 F minimum prior to welding is generally advisable; then post-heat at 1400 to 1500 F, followed by an air cool or water quench. Rezistal 430 should not be used where high impact strength is required after welding without proper heat treatment.

To obtain maximum ductility, the weld should be peened at 1300 to 1500 F. Peening refines the grain structure permitting uniform appearance on polished surfaces of the weld deposit on parent metal.

Where heat treatment is not feasible, austenitic electrodes may be used, viz: Rezistal 308, 308 LC, 309, 309 CB, 310, 310 CB and 347.

REZISTAL 442 ELECTRODES

Rezistal 442 is a non-hardenable ferritic straight chromium electrode for use where corrosion resistance to nitric acid is required.

Rezistal 442 is scale resistant, depending upon the atmosphere, up to 1800 F. Rezistal 442 should not be used where high impact strength is required after welding without proper heat treatment. For welding, a pre-heat of 300 F minimum followed by a post-heat at 1400 to 1500 F with subsequent air cooling or water quenching is required.

To obtain maximum ductility, the weld deposit should be peened at 1300 to 1500 F. Peening refines the grain structure permitting a uniform appearance on polished surfaces of the weld deposit on parent metal. This grade can be used for welding Rezistal 430 stainless.

When heat treatment is not feasible, austenitic electrodes may be used, viz: Rezistal 309, 309 CB, 310.

REZISTAL 446 ELECTRODES

Rezistal 446 is a non-hardenable ferritic straight chromium electrode having the highest scale, corrosion and heat resistant properties of the straight chromium steels.

Rezistal 446 is scale resistant, depending upon the atmosphere, up to 2100 F. It should not be used however, where heavy impact is likely to occur. It is highly resistant to cold concentrated sulphuric acid where the solution of iron in the acid would cause discoloration. In welding, a minimum pre-heat temperature of 300 F followed by a post-heat at 1400 to 1450 F with subsequent air cooling or water quenching is required. For maximum ductility, the weld deposit should be peened at 1300 to 1500 F. Peening refines the grain structure permitting a uniform appearance on polished surfaces of the weld deposit or parent metal. Where heat treatment is not feasible, austenitic electrodes may be used, viz: Rezistal 310 and 310 CB.

REZISTAL LO CRO 2 MO ELECTRODES

Rezistal Lo Cro 2 Mo is a hardenable martensitic straight chromium-molybdenum electrode which is adaptable for service temperatures up to 1200 F.

This grade is susceptible to air hardening cracking unless the material is pre-heated to a minimum 300 F prior to welding and stress relieved at 1250 to 1400 F and air cool or by fully annealing at 1500 to 1650 F and furnace cool 50 F per hour to 1200 F and air cool.

Where it is not feasible to employ heat treatment, one of the austenitic grades may be used, viz: Rezistal 308, 308 LC, 309, 309 CB, 310, 310 CB and 347.

REZISTAL 502 ELECTRODES

Rezistal 502 is a martensitic hardenable Lo Cro Mo chromium-molybdenum electrode which is adaptable for service temperatures up to 1200 F. It is popular for petroleum industry applications and has a greater resistance to corrosion than lower alloy steels. Rezistal 502 should be pre-heated at 300 F minimum for welding, followed by annealing at 1500 to 1600 F, furnace cooling at a rate of 50 degrees per hr. to 1200 F and air cool. For sub-critical annealing, the material should be post-heated after welding to 1200-1400 F and air cooled. This electrode can be used for welding Lo Cro 2 Mo Steel.

If heat treatment is not feasible, austenitic electrodes may be used, viz: Rezistal 308. 308 LC. 309, 309 CB, 310, 310 CB, 347.

REZISTAL LO CRO 9 MO

Rezistal Lo Cro 9 Mo is a martensitic hardenable chromium-molybdenum electrode adaptable for service in temperatures up to 1300 F. It is popular for petroleum industry applications, particularly in sour crude regions and has better corrosion resistance than lower chromium grades. Rezistal Lo Cro 9 Mo should be pre-heated at 300 F minimum for welding, followed by annealing at 1500 to 1600 F, furnace cooling at a rate of 50 degrees per hr. to 1200 F and air cool. If heat treatment is not feasible, austenitic electrodes may be used, viz: Rezistal 308, 308 LC, 309, 309 CB, 310, 310 CB, 347.

CRUCIBLE 99 ELECTRODES

Crucible 99 is a non-hardenable nickel electrode recommended for welding cast iron. Crucible 99 is free machining, and offers the advantage of welding many cast iron applications at room temperature without the necessity of pre-heating and post-heating.

CRUCIBLE 60 ELECTRODES

Crucible 60 is a non-hardenable nickel-iron electrode recommended for welding cast iron. It is not as free machining as Crucible 99, since heat hardness will result at the fusion line of the weld, unless certain precautionary measures are taken during welding. For welding procedure, refer to Crucible 60 Data Sheet.

HIGH CARBON AUSTENITIC HEAT RESISTING ELECTRODES

Rezistal 308 Hi C Electrode

Rezistal 308 Hi C is a non-hardenable austenitic electrode for welding Type 304, 305 and 308 high carbon castings.

Rezistal 309 Hi C Electrodes

Rezistal 309 Hi C is a non-hardenable austenitic electrode for welding Type 309 castings. Can be used for welding same grades as Rezistal 308 Hi C.

Rezistal 310 Hi C Electrodes

Rezistal 310 Hi C is a non-hardenable austenitic electrode for welding Type 310 Hi C castings. Can be used for welding same grades as Rezistal 309 Hi C.

Rezistal 330 Hi C Electrodes

Rezistal 330 Hi C is a non-hardenable austenitic electrode for welding Type 330 castings.

Rezistal 15-60 Hi C Electrodes

Rezistal 15-60 is a non-hardenable austenitic electrode for welding Type 15-60 castings. Can be used for welding Type 330 Hi C castings.

REZISTAL ELECTRODE STANDARD DIAMETERS AND LENGTHS

1/16" dia. x 9" long	3/32" dia. x 9" and 12" long	3/16" dia. x 14" long
5/64" dia. x 9" long	1/8" dia. x 14" long	1/4" dia. x 14" long
	5/32" dia. x 14" long	

Other lengths available on application

REZISTAL ELECTRODE FLUX COATINGS

In order to successfully cover the exacting requirements of the stainless welding industry, Rezistal Electrodes are manufactured with two different types of coating fluxes, namely, AC-DC Titania and DC Lime.

REZISTAL ELECTRODE FLUX COATINGS—*Continued*

1. TITANIA (Buff Coating)

Rezistal Electrodes with a buff coating indicate an AC-DC Titania flux which is designed for all position welding with exception of vertical-down. These electrodes operate with equally good results on either AC or DC current. With DC current, use reverse polarity (Electrode-positive; Work-negative). A Titania coating may be described as containing more than 20% titanium dioxide in addition to the usual alkaline earth compounds.

2. LIME (Green Coating)

Rezistal Electrodes with a green coating indicate a Lime base flux. These electrodes are especially designed for all position welding with DC current using reverse polarity (Electrode-positive; Work-negative). A lime coating may be described as consisting chiefly of compounds of alkaline earth elements containing less than 8% titanium dioxide.

Titania coating is applied to all 300 and 500 series of Rezistal Stainless Steel Electrodes, including Rezistal 430. Lime coating is applied to all grades of Rezistal Electrodes. Both coatings produce welds of equal quality in the grades they are applied to. There is, however, a difference in arcing characteristics of the two coatings. Titania coating produces a smoother arc, less spatter, smoother weld bead deposit and the slag comes off in large chunks. Lime produces a more erratic arc, the type that has a tendency to flare out, more convex bead and the slag comes off in the form of finer particles.

On the overall picture, Titania is predominantly used in all position welding, with the exception of vertical-down. It is not recommended for this position welding as the slag has an extreme tendency to flow ahead of the molten metal and solidify, then insulate out the arc as the molten puddle reaches the point of solidified slag.

WELDING PROCEDURE

In the welding of stainless steels with Rezistal coated Electrodes, the physical and mechanical properties of the parent metal must be taken into consideration. This is extremely important when welding the austenitic chromium-nickel grades as they have a high coefficient of expansion, high electrical resistance and a low thermal conductivity. The hardenable chromium grades, due to their hardening characteristics, must be correctly pre- and post-heated. The non-hardening chromium grades, on the other hand, must receive proper stress relieving. The correct heat-treatment recommendations for all types, may be secured from the corresponding "Rezistal Data Sheet."

ARC WELDING

The recommended polarity for DC welding generally is reversed polarity, having the electrode positive and the work negative. A close arc should be maintained at all times when welding with either DC or AC current. The welding arc length is governed by the amount of voltage drawn across the arc. When voltage is maintained at, or relatively near, the values given in the current range tables (see page 195) proper arc length will result. Proper welding current adjustment is most essential for best results.

FLAT POSITION WELDING

Welding technique is similar to that for mild steel with the exception that oscillation of the electrode is not recommended, i.e., taking the electrode out of the weld puddle and advancing a distance ahead of the puddle, then moving back into it. Weaving should be limited to two and one-half times the diameter of the electrode. Less current is necessary than for mild steel welding because the stainless steels have higher electrical resistance and lower heat conductivity than mild steel.

VERTICAL-DOWN WELDING

Vertical-down welding in stainless steel is not generally recommended with exception of extremely light gauge. There are several variables to contend with; once the arc is established, welding must be maintained at uniform speed of travel; any hesitation on the part of the operator will permit the slag to flow ahead of the molten pool, and cause arcing interference, poor fusion, slag inclusions, cold shuts, porositv and weld-bead cracking.

However, in the application of stainless strip lining in carbon steel vessels, vertical down-welding is entirely satisfactory. This is due to the higher heat dissipation of the backing material which permits the successful use of high welding currents, without the danger of burning through or slag interference.

VERTICAL-UP WELDING

For the best mechanical properties in a vertical seam, welding should be done starting at the bottom and working up on thickness approximately 18 gauge and heavier. If the vertical-down position is necessary only Lime coated electrodes should be used.

VERTICAL AND OVERHEAD

In general, for applications in vertical and overhead welding, the use of electrodes larger than 3/16 in. diameter is not recommended—5/32 in. max. is preferable. This is due to the inherent tendency for the development of a large molten weld pool, which presents difficulty to the operator from a standpoint of weld metal deposition. The use of a 5/32 in. maximum diameter electrode will prove to be advantageous, as the electrode can be maintained in the molten pool at all times during welding. This is essential for welding stainless steels.

LIGHT GAUGES

To maintain alignment and minimize warpage, light gauge sheets should be clamped, preferably in a jig, using copper backing with a suitable groove in the copper. When this set-up is not feasible, steel strips along each side of the seam will minimize warpage and help maintain the alignment of the seam. In tack welding light gauge sheets, it is important that tack welds be placed at close intervals to prevent buckling between the tacks on subsequent weld. Buckling may result in poor quality welds due to excessive burning through, cold shuts, slag inclusions and irregular penetration. On extremely light gauge sheets where penetration is instantaneous, straight polarity may be employed as an expedient to minimize any tendency for burning through. The practice of leaving the seam of a butt joint open more at one end than the other prior to welding is not necessary.

HEAVY GAUGES

For heavy gauge welding where multiple pass welding is employed, it is imperative that the slag be thoroughly cleaned from the preceding weld before starting subsequent welding. To eliminate a rough start when re-establishing an arc at the crater of a previously deposited weld, strike the arc at the top of the crater and draw an abnormally long arc. Then manipulate the electrode in a fanning manner, momentarily, to assure a very thin deposit of weld metal at this point. This also acts as a pre-heat to assure good penetration when progressing forward into the depth of the crater. The arc length should be shortened simultaneously until normal arc length is attained. This procedure will result in a smooth and sound weld.

HELIARC

Heliarc welding is done primarily without the use of a filler rod. The weld metal for the seam is supplied from the parent metal by butting the edges of the sheets tightly together and fusing them. The edges of the sheets must be squared absolutely true. Otherwise, the resultant openings will necessitate the use of a filler rod. The filler rod is flowed into the seam in the same manner as that employed for oxy-acetylene welding.

OXY-ACETYLENE

Oxy-acetylene welding is used primarily for light gauge welding to which electric arc or other welding methods do not lend themselves readily.

The process is still quite popular for field welding where gas driven motor generator welders are not available or where Heliarc is not adaptable because of surrounding atmosphere which would blow away the protective inert gas atmosphere from the molten metal.

A reducing flame (carbonizing flame) is generally used to facilitate better flowing characteristics of the molten weld metal, but care must be exercised in controlling the length of the reducing flame where corrosion is a factor in order to prevent carbon pick up in the weld from the welding flame. A reducing flame is identified by a feather flickering slightly over the end of the inner cone of the flame. The feather should be just visible and no more. However, where corrosion is not a factor, particularly on heat resisting applications, the feather may be increased.

When it is important to minimize carbide precipitation in the weld, a columbium bearing welding rod should be used. This is especially desirable when water cooling during welding and/or post annealing is not feasible.

This process is the most critical of all hand welding methods as far as influencing carbide precipitation in austenitic stainless steels, because the temperature of the flame is considerably lower than other welding processes. This means a longer time is required to bring the parent metal up to welding temperature, subjecting the weld area to the critical sensitizing temperature range of 800 to 1500 F resulting in excessive carbide precipitation.

Note: For further information on welding and other welding processes, refer to Crucible's publication—"Joining of Crucible Rezistal Stainless Steels."

MAGNETIC ARC BLOW

Frequently on flat, vertical, overhead and "in corner" welding with DC current, magnetic arc blow is a problem which seriously interferes with the production of sound welds. This condition is predominant when welding the carbon, alloy, low chromium, and high chromium steels. The cause of arc blow is the presence of a magnetic field in the pieces to be welded, the field being concentrated in the air-gap set up between the edges of the plates to be joined. The existence of a magnetic field creating arc blow, may be due to any of the following three conditions, or a combination of all three:

1. Residual magnetism in the plates resulting from handling or moving the plates with electro-magnets.
2. Magnetism induced in the plates by the earth's magnetic field. Although the density of the earth's field is relatively weak, it can be concentrated at the breaking points of continuity in large masses or structures (such as along welding seams) so that its effect is most pronounced.
3. The close proximity of DC cables to the welding seam.

The presence of a magnetic field at the weld seam caused by any one of the above three conditions has the effect of causing a directional pressure of variable intensity on the flow of current and molten weld metal. When this pressure or force is high enough and in counter direction to the direction of welding, the arc will become "wild" and will "blow." In order to eliminate magnetic arc blow, the use of Crucible "Little Giant" Cast Alnico Horseshoe Magnets is recommended. The magnets should be placed so that they straddle a weld seam, having one pole on each plate. When two magnets are used, they should be placed so that a complete circuit is formed. This requires the magnets to have opposite magnetic poles on the same plate. This can readily be checked by the use of a compass or by placing the two magnets together prior to placing them on the poles. When the magnets are brought together, they should attract each other, since unlike poles attract and like poles repel. By the proper location and spacing of the magnets on the work, the residual magnetism in the plates can be completely neutralized, and, as a result, controlled and effective welding can be obtained.

ALTERNATE ELECTRODES

In order to assist in suggesting alternates in various grades of electrodes when the desired material is not available, the following grades may be substituted.

Base Metal	*Proper Grade Electrode*	*Alternate Grade Electrode*
302 B	302 B	309, 309 Cb, 310, 310 Cb
201, 202, 301, 302 304, 305, 308	308	308 LC, 347, 309, 309 Cb, 309 Mo, 310, 310 Cb, 316, 316 LC, 318
304 LC	308 LC	347, 309 Cb, 310 Cb, 316 LC, 315, 310 Mo Cb
308	308	309, 310, 310 Mo, 316, 318, 317, 316 LC, 347
309	309	309 Cb, 310, 310 Cb, 310 Mo, 310 Mo Cb
310	310	310 Cb, 310 Mo, 310 Mo Cb
310 Cb	310 Cb	310 Mo Cb
311	310	310 Cb, 310 Mo, 310 Mo Cb
312	312	None
314	310	310 Mo, 310 Mo Cb
316	316	318, 316 LC, 309 Mo, 310 Mo, 317, 310 Mo Cb
316 LC	316 LC	310 Mo Cb
317	317	316, 318, 309 Mo, 310 Mo, 310 Mo Cb
318	318	310 Mo Cb
321	347	308 LC, 309 Cb, 310 Cb, 318, 316 LC
330	330	15-60
347	347	308 LC, 309 Cb, 310 Cb, 318 (316 LC)
410	410	308, 308 LC, 347, 309, 309 CB, 310, 310 Cb
430	430	442, 308, 308 LC, 347, 309, 309 Cb, 310, 310 Cb
442	442	446, 309, 309 Cb, 310, 310 Cb, 330
446	446	310, 310 Cb, 330
Lo Cro 2 Mo	Lo Cro 2 Mo	502, Lo Cro 9 Mo (also same austenitic substitution as for 410)
502, 501	502	Lo Cro 9 Mo, 410 (also same austenitic substitution as for 410)
Lo Cro 9 Mo	Lo Cro 9 Mo	410, 308, 308 LC, 309, 309 Cb 310, 310 Cb
15-60	15-60	20-80
20-80	20-80	None

REZISTAL STAINLESS STEEL ELECTRODES

Table of Recommended Current Ranges For AC or DC Welding

***IMPORTANT:** Current range readings below represent current passing across the arc during welding.*

Electrode Diameter Inch	*Material Gauge*		*Chromium Nickel Electrodes*				*Straight Chromium Electrodes*				*Lo Cro 2 Mo. 502 & Lo Cro 9 Mo. Electrodes*			
	U.S Std. (Rev.)	*Equivalent Inches*	*Volts*	*Flat Amperes*	*Vertical Up Amperes*	*Overhead Amperes*	*Volts*	*Flat Amperes*	*Vertical Up Amperes*	*Overhead Amperes*	*Volts*	*Flat Amperes*	*Vertical Up Amperes*	*Overhead Amperes*
*1/16	24/20	.025/.037	20	20/35	20/25	20/30								
5/64	22/26	.031/.062	21	30/45	30/35	30/40								
3/32	18/12	.050/.109	22	50/70	45/55	50/60	22	55/75	50/60	55/70	22	65/85	60/70	65/75
1/8	12/7	.109/.187	23	90/110	75/85	90/100	23	100/120	90/100	100/115	23/24	120/145	95/110	120/135
5/32	7/7/0's	.187/.500	24/25	125/150	95/110	124/140	24/25	135/165	110/120	135/155	24/26	150/180	125/140	150/170
3/16	3/0's	.375/.750	25/27	155/195	105/120	155/185	25/27	170/210	115/130	170/200	26/28	215/255	140/155	215/245
1/4	—	.375 & over	26/28	240/290			26/28	260/310			28/30	315/360		
*5/16	—	—	27/30	325/375										

DC Polarity: Electrode—positive, Work—negative.

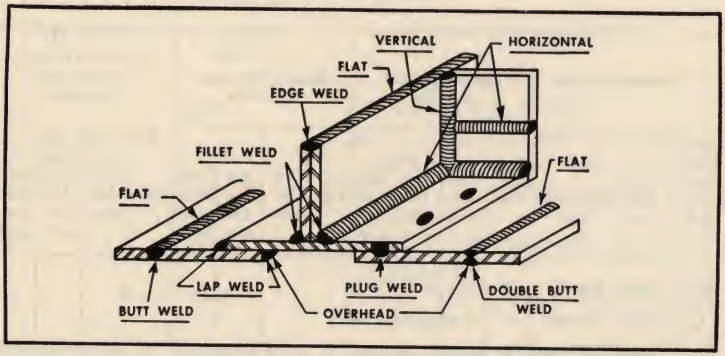
Optimum current setting normally selected at center of current table.

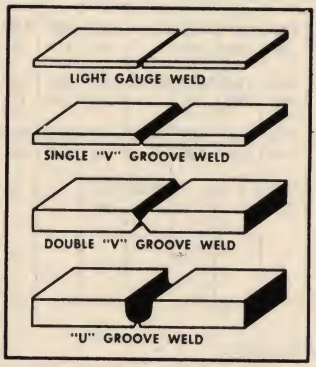
Vertical down continuous welding: Use only Lime Base Coated Electrodes with the same current setting as flat position.

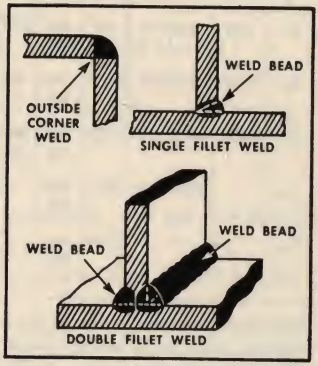
*AC current recommended. If DC employed: Use Alnico Magnets to eliminate arc blow.

WELDING JOINTS ILLUSTRATED

LEADING TYPES OF WELDING JOINTS







BASIC WELDING SYMBOLS

ARC AND GAS WELD SYMBOLS

TYPE OF WELD							
BEAD	FILLET	PLUG OR SLOT	GROOVE				
			SQUARE	V	BEVEL	U	J
							

WELD ALL AROUND	FIELD WELD	CONTOUR	
		FLUSH	CONVEX
			

RESISTANCE WELD SYMBOLS

TYPE OF WELD			
SPOT	PROJECTION	SEAM	FLASH OR UPSET
			

MISCELLANEOUS STEELS

Index

MISCELLANEOUS STEELS

Index

MISCELLANEOUS STEELS

Listed on the following pages are the grades and sizes of miscellaneous steels carried in Crucible Branch-warehouses. Each product is of the highest quality and you are assured of dependable, consistent results.

Although somewhat special in nature, they are stocked to meet the demands of certain industries.

●

CHAMPALOY STEEL BARS

Carbon 0.75% **Manganese 0.70%** **Nickel 1.50%**
Chromium 0.75% **Molybdenum 0.30%**

Hot Rolled Annealed

Champaloy is an electric furnace alloy steel suitable for general purpose applications. It is recommended for such uses as pinions, collets, bushings, cams, rachets and heavy duty rolls.

ROUNDS

½	1⅜	2½	4¼	7
⅝	1½	2¾	4½	7½
11/16	1⅝	3	4¾	8⅛
¾	1¾	3¼	5	9⅛
⅞	2	3½	5½	10⅛
1	2⅛	3¾	6	11⅛
1⅛	2¼	4	6½	12⅛
1¼				

FLATS

1 x ⅜	4 x ½	1½ x 1	2 x 1¼
1½ x ⅜	5 x ½	2 x 1	2½ x 1¼
2 x ⅜	6 x ½	2½ x 1	3 x 1¼
5 x ⅜	1¼ x ⅝	3 x 1	4 x 1¼
1 x ½	1½ x ⅝	3½ x 1	4½ x 1¼
1¼ x ½	2 x ⅝	4 x 1	5 x 1¼
1½ x ½	2 x ¾	4½ x 1	6 x 1¼
2 x ½	2½ x ¾	5 x 1	8 x 1¼
2½ x ½	3½ x ¾	6 x 1	1¾ x 1½
3 x ½	4 x ¾	8 x 1	2 x 1½

CHAMPALOY STEEL BARS—*Continued*

FLATS—*Continued*

3 x 1½	8 x 1½	6 x 2	6 x 2½
4 x 1½	2½ x 2	8 x 2	4 x 3
5 x 1½	3 x 2	3 x 2½	5 x 3
6 x 1½	3½ x 2	3½ x 2½	6 x 3
7 x 1½	4 x 2	4 x 2½	6 x 4

SQUARES

½	1	2	3
⅝	1¼	2½	4
¾	1½		

KETOS MACHINED JEWELER'S DIE BLOCKS

Annealed

1⅞ Face	2¾6 Face

BUTCHER SAW BLADE STEEL

21/32 x .020

LITTLE GIANT ALNICO I BLUE DOT MAGNETS

Magnetized, Painted Red With Keepers

The "Little Giant" of the aluminum-nickel-cobalt type is one of the most powerful magnets ever produced. The small horseshoe type weighing one tenth of a pound will lift approximately forty times its own weight.

There are many useful applications for "Little Giant" Magnets, such as gathering of tools accidentally dropped in quenching and plating baths, also tools that drop into otherwise inaccessible places.

In addition to these stocked sizes "Little Giant" Magnets are available from mill delivery in a wide range of sizes and shapes in quantities.

1022 Size	1031 Size	1041 Size	1060 Size

ALNICO NO. V SPEAKER MAGNETS

Not Magnetized

LG 1	LG 4	LG 7
LG 2	LG 5	LG 8
LG 3	LG 6	LG 9A

STANDARD SCALE PIVOT STEEL

Natural

#3 ($\frac{15}{64}$ x $\frac{19}{64}$)	#8 ($\frac{7}{16}$ x $\frac{19}{32}$)	#12 ($\frac{11}{16}$ x $\frac{15}{16}$)
#4 ($\frac{1}{4}$ x $\frac{21}{64}$)	#9 ($\frac{15}{32}$ x $\frac{5}{8}$)	#13 ($\frac{13}{16}$ x $1\frac{1}{32}$)
#5 ($\frac{9}{32}$ x $\frac{3}{8}$)	#10 ($\frac{31}{64}$ x $\frac{43}{64}$)	#2E ($\frac{7}{8}$ x $\frac{7}{32}$)
#6 ($\frac{5}{16}$ x $\frac{27}{64}$)	#11 ($\frac{17}{32}$ x $\frac{47}{64}$)	#4E ($\frac{39}{64}$ x $\frac{53}{64}$)
#7 ($\frac{3}{8}$ x $\frac{33}{64}$)		

PARK HIGH CARBON STEEL BARS

Open Hearth Chisel Steel

0.85% Carbon

Natural

Park High Carbon is a good quality water hardening carbon steel for general shop applications. It responds uniformly to normal heat treatments and is particularly well adapted for service where production requirements are indefinite and subject to short runs and frequent changes.

OCTAGONS

$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$
$\frac{5}{8}$	$\frac{7}{8}$	$1\frac{1}{8}$	$1\frac{1}{2}$
$\frac{11}{16}$			

ONYX SPRING STEEL BARS

Hot Rolled Natural

The greatest care is exercised in the manufacture of this specialized grade. It is recommended for all purposes where a good high grade spring steel is required.

ROUNDS

$\frac{3}{16}$	$\frac{5}{16}$	$\frac{7}{16}$	$\frac{5}{8}$	$\frac{7}{8}$
$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	1

ONYX SPRING STEEL BARS—*Continued*

FLATS *(Round Edge)*

3/8 x 1/16	1 3/4 x 1/8	2 x 1/4	3 1/2 x 3/8
1/2 x 1/16	2 x 1/8	2 1/4 x 1/4	4 x 3/8
5/8 x 1/16	2 1/4 x 1/8	2 1/2 x 1/4	4 1/2 x 3/8
3/4 x 1/16	2 1/2 x 1/8	3 x 1/4	5 x 3/8
1 x 1/16	3 x 1/8	3 1/2 x 1/4	6 x 3/8
1 1/4 x 1/16	3 1/2 x 1/8	4 x 1/4	3 x 7/16
1 1/2 x 1/16	4 x 1/8	3/4 x 5/16	3 1/2 x 7/16
1 3/4 x 1/16	1/2 x 3/16	1 x 5/16	4 x 7/16
2 x 1/16	5/8 x 3/16	1 1/4 x 5/16	4 1/2 x 7/16
2 1/2 x 1/16	3/4 x 3/16	1 1/2 x 5/16	5 x 7/16
1/2 x 3/32	7/8 x 3/16	1 3/4 x 5/16	6 x 7/16
5/8 x 3/32	1 x 3/16	2 x 5/16	1 x 1/2
3/4 x 3/32	1 1/4 x 3/16	2 1/4 x 5/16	1 1/2 x 1/2
1 x 3/32	1 1/2 x 3/16	2 1/2 x 5/16	1 3/4 x 1/2
1 1/4 x 3/32	1 3/4 x 3/16	3 x 5/16	2 x 1/2
1 1/2 x 3/32	2 x 3/16	1 x 3/8	2 1/2 x 1/2
2 x 3/32	2 1/2 x 3/16	1 1/4 x 3/8	3 x 1/2
3/8 x 1/8	3 x 3/16	1 1/2 x 3/8	3 1/2 x 1/2
1/2 x 1/8	1/2 x 1/4	1 3/4 x 3/8	4 x 1/2
5/8 x 1/8	5/8 x 1/4	2 x 3/8	4 1/2 x 1/2
3/4 x 1/8	1 x 1/4	2 1/4 x 3/8	5 x 1/2
1 x 1/8	1 1/4 x 1/4	2 1/2 x 3/8	5 1/2 x 1/2
1 1/4 x 1/8	1 1/2 x 1/4	3 x 3/8	6 x 1/2
1 1/2 x 1/8	1 3/4 x 1/4		

SPECIFICATION #55 CHROME NICKEL MOLY SHEETS

Hot Rolled Annealed

Carbon 0.68% **Manganese 0.60%** **Nickel 0.65%**
Chromium 0.70% **Molybdenum 0.20%**

Specification #55 is a Special analysis designed for the manufacture of various types of saws, particularly circular saws. These sheets might be adapted to other applications requiring similar properties after heat treating.

.180 x 18 x 72	.083 x 18 x 72
.165 x 18 x 72	.072 x 18 x 72
.148 x 18 x 72	.072 x 25 x 72
.134 x 18 x 72	.065 x 18 x 72
.120 x 18 x 72	.065 x 25 x 72
.109 x 18 x 72	.058 x 18 x 72
.095 x 18 x 72	

TABLES

Index

TABLES

Index

HANDY METHODS TO ESTIMATE APPROXIMATE WEIGHT OF CARBON STEEL BARS

ROUNDS

Multiply diameter by bar by 4. Square the result and divide by 6. For example:

Size 3″ rd.— 3 × 4 = 12
12 × 12 = 144
144 ÷ 6 = 24 lbs. per foot

SQUARES

Square the section and add a cipher. This gives the weight per yard. Divide by 3 to get weight per foot. For example:

Size 4″ square—4 × 4 = 16
Add a cipher = 160 lbs. per yd.
160 ÷ 3 = 53.33 lbs. per foot

FLATS

Multiply the width by thickness. Add a cipher and divide by 3. For example:

Size 4″ x 1″—4 × 1 = 4
Add a cipher = 40
40 ÷ 3 = 13.33 lbs. per foot

HANDY CARBON STEEL WEIGHT FORMULAS

Shape	*Pounds per Foot*	*Feet per Pound*	*Shape*	*Pounds per Foot*	*Feet per Pound*
Round.....	$2.667 \times d^2$	$.3749 \div d^2$	Hexagonal..	$2.942 \times d^2$	$.3398 \div d^2$
Flat.....	$3.396 \times$ wt	$.2945 \div$ wt	Half Round.	$1.334 \times d^2$	$.7498 \div d^2$
Square.....	$3.396 \times d^2$	$.2945 \div d^2$	Half Oval...	$2.647 \times$ wt	$.3778 \div$ wt

WEIGHTS OF CARBON BAR STEEL

PER LINEAR FOOT

Conversion Factors (Approximate): Tungsten High Speed Steel 1.11, Molybdenum High Speed Steels—Rex M-2 1.03, Rex VM and Rex TMO 1.01, Aluminum 0.346 Brass 1.07, Cast Iron 1.03, Copper and Bronze 1.128

Size in Inches	*Round*	*Square*	*Octagon*	*Hexagon*	*Size in Inches*	*Round*	*Square*	*Octagon*	*Hexagon*
1/16	.010	.013	.011	.012	9/16	.845	1.076	.892	.932
5/64	.017	.022	.018	.019	37/64	.893	1.136	.943	.985
3/32	.023	.029	.024	.025	19/32	.941	1.199	.994	1.038
7/64	.031	.039	.033	.034	39/64	.992	1.263	1.048	1.094
1/8	.042	.053	.044	.046	5/8	1.043	1.328	1.102	1.150
9/64	.053	.067	.056	.058	41/64	1.096	1.395	1.517	1.209
5/32	.065	.083	.069	.072	21/32	1.150	1.464	1.214	1.268
11/64	.079	.100	.083	.087	43/64	1.205	1.535	1.272	1.329
3/16	.094	.120	.099	.104	11/16	1.262	1.607	1.333	1.392
13/64	.110	.140	.116	.121	45/64	1.320	1.681	1.394	1.456
7/32	.128	.163	.135	.141	23/32	1.380	1.756	1.487	1.521
15/64	.147	.187	.155	.162	47/64	1.440	1.834	1.521	1.588
1/4	.167	.213	.176	.184	3/4	1.502	1.913	1.586	1.656
17/64	.188	.240	.199	.207	25/32	1.630	2.075	1.721	1.797
9/32	.211	.269	.223	.233	13/16	1.763	2.245	1.862	1.944
19/64	.235	.300	.248	.259	27/32	1.901	2.421	2.008	2.096
5/16	.261	.332	.275	.288	7/8	2.045	2.603	2.159	2.254
21/64	.288	.360	.304	.318	29/32	2.193	2.792	2.316	2.418
11/32	.316	.402	.334	.348	15/16	2.347	2.988	2.479	2.588
23/64	.345	.439	.364	.381	31/32	2.506	3.191	2.646	2.763
3/8	.376	.478	.397	.414	1	2.670	3.400	2.820	2.945
25/64	.408	.519	.431	.450	1 1/16	3.015	3.838	3.183	3.324
13/32	.441	.561	.466	.486	1 1/8	3.380	4.303	3.569	3.727
27/64	.475	.605	.502	.524	1 3/16	3.766	4.795	3.977	4.152
7/16	.511	.651	.540	.564	1 1/4	4.172	5.313	4.407	4.601
29/64	.548	.698	.579	.604	1 5/16	4.600	5.857	4.858	5.072
15/32	.587	.747	.620	.647	1 3/8	5.049	6.428	5.332	5.567
31/64	.627	.798	.662	.692	1 7/16	5.518	7.026	5.827	6.085
1/2	.668	.850	.705	.736	1 1/2	6.008	7.650	6.345	6.625
33/64	.710	.904	.750	.783	1 9/16	6.519	8.301	6.885	7.189
17/32	.754	.960	.796	.831	1 5/8	7.051	8.978	7.446	7.775
35/64	.799	1.017	.844	.881	1 11/16	7.604	9.682	8.030	8.385

WEIGHTS OF CARBON BAR STEEL—*Continued*
PER LINEAR FOOT

Size in Inches	*Round*	*Square*	*Octa-gon*	*Hexa-gon*	*Size in Inches*	*Round*	*Square*	*Octa-gon*
1¾	8.178	10.41	8.634	9.018	5	66.76	85.00	70.50
1 13/16	8.773	11.17	9.265	9.673	5 1/16	68.44	87.14	72.27
1⅞	9.388	11.95	9.911	10.35	5⅛	70.14	89.30	74.07
1 15/16	10.02	12.76	10.58	11.05	5 3/16	71.86	91.50	75.89
2	10.68	13.60	11.28	11.78	5¼	73.60	93.71	77.72
2 1/16	11.36	14.46	11.99	12.53	5 5/16	75.36	95.96	79.59
2⅛	12.06	15.35	12.73	13.30	5⅜	77.15	98.23	81.47
2 3/16	12.78	16.27	13.49	14.09	5 7/16	78.95	100.5	83.38
2¼	13.52	17.21	14.27	14.91	5½	80.78	102.9	85.30
2 5/16	14.28	18.18	15.08	15.75	5 9/16	82.62	105.2	87.25
2⅜	15.06	19.18	15.91	16.61	5⅝	84.49	107.6	89.23
2 7/16	15.87	20.20	16.75	17.49	5 11/16	86.38	110.0	91.22
2½	16.69	21.25	17.62	18.40	5¾	88.29	112.4	93.23
2 9/16	17.53	22.33	18.52	19.34	5 13/16	90.22	114.9	95.27
2⅝	18.40	23.43	19.43	20.29	5⅞	92.17	117.4	97.33
2 11/16	19.29	24.56	20.37	21.27	5 15/16	94.14	119.9	99.41
2¾	20.19	25.71	21.33	22.27	6	96.13	122.4	101.5
2 13/16	21.12	26.90	22.31	23.29	6 1/16	98.15	125.0	103.6
2⅞	22.07	28.10	23.31	24.34	6⅛	100.2	127.6	105.8
2 15/16	23.04	29.34	24.33	25.41	6 3/16	102.2	130.2	108.0
3	24.03	30.60	25.38	26.50	6¼	104.3	132.8	110.2
3 1/16	25.05	31.89	26.45	27.62	6 5/16	106.4	135.5	112.4
3⅛	26.08	33.20	27.54	28.76	6⅜	108.5	138.2	114.6
3 3/16	27.13	34.55	28.65	29.92	6 7/16	110.7	140.9	116.9
3¼	28.21	35.91	29.79	....	6½	112.8	143.7	119.1
3 5/16	29.30	37.21	30.94	....	6 9/16	115.0	146.4	121.4
3⅜	30.42	38.73	32.12	....	6⅝	117.2	149.2	123.8
3 7/16	31.55	40.18	33.32	....	6 11/16	119.4	152.1	126.1
3½	32.71	41.65	34.54	....	6¾	121.7	154.9	128.5
3 9/16	33.90	43.15	35.79	....	6 13/16	123.9	157.8	130.9
3⅝	35.09	44.68	37.07	....	6⅞	126.2	160.7	133.3
3 11/16	36.31	46.23	38.34	....	6 15/16	128.5	163.6	135.7
3¾	37.55	47.81	39.65	....	7	130.9	166.6	138.2
3 13/16	38.81	49.42	40.99	....	7 1/16	133.2	169.6	140.7
3⅞	40.10	51.05	42.34	....	7⅛	135.6	172.6	143.2
3 15/16	41.40	52.71	43.72	....	7 3/16	138.0	175.6	145.7
4	42.73	54.40	45.12	....	7¼	140.4	178.7	148.2
4 1/16	44.07	56.11	46.54	....	7 5/16	142.8	181.8	150.8
4⅛	45.44	57.85	47.98	....	7⅜	145.2	184.9	153.4
4 3/16	46.83	59.62	49.45	....	7 7/16	147.7	188.1	156.0
4¼	48.23	61.41	50.93	....	7½	150.2	191.3	158.6
4 5/16	49.66	63.23	52.44	....	7⅝	155.3	197.7	164.0
4⅜	51.11	65.08	53.98	....	7¾	160.4	204.2	169.4
4 7/16	52.58	66.95	55.53	....	7⅞	165.6	210.9	174.9
4½	54.08	68.85	57.10	....	8	170.9	217.6	180.5
4 9/16	55.59	70.78	58.70	....	8¼	181.8	230.9	192.0
4⅝	57.12	72.73	60.32	....	8½	192.9	245.7	203.8
4 11/16	58.68	74.71	61.96	....	8¾	204.4	259.6	215.8
4¾	60.25	76.71	63.63	....	9	216.3	275.4	228.4
4 13/16	61.85	78.75	65.32	....	10	267.0	340.0	282.0
4⅞	63.46	80.80	67.02	....	11	323.1	411.4	341.2
4 15/16	65.10	82.89	68.75	....	12	384.4	489.6	406.1

WEIGHTS OF ROUND CARBON BAR STEEL

PER LINEAR INCH

Conversion factors approximate: Tungsten High Speed Steel 1.11, Molybdenum High Speed Steels—Rex M-2 1.03, Rex VM and Rex TMO 1.01, Aluminum 0.346, Brass 1.07, Cast Iron 1.03, Copper and Bronze 1.128

Diameter	*Pounds*	*Diameter*	*Pounds*	*Diameter*	*Pounds*	*Diameter*	*Pounds*
0	....	0	3.57	0	14.28	0	32.13
1/16	....	1/16	3.68	1/16	14.50	1/16	32.46
1/8	....	1/8	3.80	1/8	14.73	1/8	32.80
3/16	....	3/16	3.91	3/16	14.95	3/16	33.13
1/4	.01	1/4	4.03	1/4	15.18	1/4	33.48
5/16	.02	5/16	4.14	5/16	15.41	5/16	33.81
3/8	.03	3/8	4.27	3/8	15.65	3/8	34.17
7/16	.04	7/16	4.39	7/16	15.88	7/16	34.51
0 1/2	.06	4 1/2	4.52	8 1/2	16.12	12 1/2	34.86
9/16	.07	9/16	4.64	9/16	16.36	9/16	35.21
5/8	.09	5/8	4.77	5/8	16.60	5/8	35.56
11/16	.11	11/16	4.90	11/16	16.83	11/16	35.91
3/4	.13	3/4	5.03	3/4	17.08	3/4	36.27
13/16	.15	13/16	5.17	13/16	17.32	13/16	36.62
7/8	.17	7/8	5.30	7/8	17.57	7/8	36.98
15/16	.20	15/16	5.44	15/16	17.82	15/16	37.33
0	.22	0	5.58	0	18.07	0	37.70
1/16	.25	1/16	5.72	1/16	18.32	1/16	38.06
1/8	.28	1/8	5.86	1/8	18.58	1/8	38.42
3/16	.31	3/16	6.00	3/16	18.83	3/16	38.79
1/4	.35	1/4	6.15	1/4	19.09	1/4	39.16
5/16	.38	5/16	6.30	5/16	19.34	5/16	39.53
3/8	.42	3/8	6.45	3/8	19.61	3/8	39.90
1 7/16	.46	7/16	6.60	7/16	19.87	7/16	40.28
1/2	.50	5 1/2	6.75	9 1/2	20.13	13 1/2	40.65
9/16	.54	9/16	6.90	9/16	20.40	9/16	41.03
5/8	.59	5/8	7.06	5/8	20.67	5/8	41.41
11/16	.64	11/16	7.22	11/16	20.93	11/16	41.79
3/4	.68	3/4	7.38	3/4	21.21	3/4	42.17
13/16	.73	13/16	7.54	13/16	21.48	13/16	42.56
7/8	.78	7/8	7.70	7/8	21.76	7/8	42.94
15/16	.84	15/16	7.86	15/16	22.03	15/16	43.33
0	.89	0	8.03	0	22.31	0	43.72
1/16	.95	1/16	8.20	1/16	22.59	1/16	44.11
1/8	1.01	1/8	8.37	1/8	22.87	1/8	44.50
3/16	1.07	3/16	8.54	3/16	23.15	3/16	44.90
1/4	1.13	1/4	8.71	1/4	23.44	1/4	45.29
5/16	1.19	5/16	8.89	5/16	23.72	5/16	45.69
3/8	1.26	3/8	9.07	3/8	24.01	3/8	46.09
7/16	1.33	7/16	9.25	7/16	24.30	7/16	46.49
2 1/2	1.39	6 1/2	9.43	10 1/2	24.60	14 1/2	46.90
9/16	1.46	9/16	9.61	9/16	24.89	9/16	47.30
5/8	1.54	5/8	9.79	5/8	25.19	5/8	47.71
11/16	1.61	11/16	9.98	11/16	25.48	11/16	48.12
3/4	1.69	3/4	10.16	3/4	25.78	3/4	48.53
13/16	1.76	13/16	10.35	13/16	26.08	13/16	48.94
7/8	1.84	7/8	10.54	7/8	26.39	7/8	49.35
15/16	1.92	15/16	10.74	15/16	26.68	15/16	49.77
0	2.01	0	10.93	0	27.00	0	50.19
1/16	2.09	1/16	11.13	1/16	27.30	1/16	50.61
1/8	2.18	1/8	11.33	1/8	27.61	1/8	51.03
3/16	2.27	3/16	11.52	3/16	27.92	3/16	51.45
1/4	2.36	1/4	11.73	1/4	28.24	1/4	51.87
5/16	2.45	5/16	11.93	5/16	28.54	5/16	52.30
3/8	2.54	3/8	12.13	3/8	28.87	3/8	52.73
7/16	2.64	7/16	12.34	7/16	29.19	7/16	53.16
3 1/2	2.73	7 1/2	12.55	11 1/2	29.50	15 1/2	53.59
9/16	2.83	9/16	12.76	9/16	29.83	9/16	54.02
5/8	2.93	5/8	12.97	5/8	30.15	5/8	54.46
11/16	3.03	11/16	13.18	11/16	30.47	11/16	54.89
3/4	3.14	3/4	13.40	3/4	30.80	3/4	55.33
13/16	3.24	13/16	13.61	13/16	31.12	13/16	55.77
7/8	3.35	7/8	13.84	7/8	31.46	7/8	56.21
15/16	3.46	15/16	14.05	15/16	31.79	15/16	56.66

WEIGHTS OF FLAT CARBON BAR STEEL
PER LINEAR FOOT

Conversion factors approximate: Tungsten High Speed Steel 1.11, Molybdenum High Speed Steels—Rex M-2 1.03, Rex VM and Rex TMO 1.01, Aluminum 0.346, Brass 1.07, Cast Iron 1.03, Copper and Bronze 1.128

	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8
1/16	.1060	.1381	.1594	.1859	.212	.2391	.2656	.292
1/8	.2125	.2656	.3188	.3720	.425	.4782	.5312	.585
3/16	.319	.399	.478	.558	.638	.717	.797	.875
1/4	.425	.531	.636	.743	.850	.957	1.06	1.17
5/16	.531	.664	.797	.929	1.06	1.20	1.33	1.46
3/8	.638	.797	.957	1.116	1.28	1.43	1.59	1.76
7/16	.744	.929	1.116	1.302	1.49	1.68	1.86	2.05
1/2	.850	1.06	1.275	1.487	1.70	1.92	2.12	2.34
9/16	.957	1.20	1.434	1.674	1.92	2.15	2.39	2.63
5/8	1.06	1.33	1.594	1.859	2.12	2.39	2.65	2.92
11/16	1.17	1.46	1.753	2.045	2.34	2.63	2.92	3.22
3/4	1.28	1.60	1.913	2.232	2.55	2.87	3.19	3.51
13/16	1.38	1.73	2.072	2.417	2.76	3.11	3.45	3.80
7/8	1.49	1.86	2.232	2.604	2.98	3.35	3.72	4.09
15/16	1.60	1.99	2.391	2.789	3.19	3.59	3.99	4.39
1	1.70	2.13	2.55	2.98	3.40	3.83	4.25	4.68
1 1/8	1.91	2.39	2.87	3.35	3.83	4.30	4.78	5.26
1 1/4	2.12	2.66	3.19	3.72	4.25	4.79	5.31	5.85
1 3/8	2.34	2.92	3.51	4.09	4.67	5.26	5.84	6.43
1 1/2	2.55	3.19	3.83	4.47	5.10	5.74	6.38	7.02
1 5/8	2.76	3.45	4.15	4.84	5.52	6.22	6.90	7.60
1 3/4	2.98	3.72	4.47	5.21	5.95	6.70	7.44	8.19
1 7/8	3.19	3.99	4.79	5.58	6.38	7.17	7.97	8.77
2	3.40	4.25	5.10	5.95	6.80	7.65	8.50	9.35

	1 1/2	1 5/8	1 3/4	2	2 1/4	2 1/2	2 3/4	3
1/16	.319	.346	.372	.425	.478	.531	.584	.638
1/8	.638	.692	.744	.850	.96	1.06	1.17	1.28
3/16	.957	1.04	1.15	1.28	1.44	1.59	1.75	1.91
1/4	1.28	1.38	1.49	1.70	1.92	2.12	2.34	2.55
5/16	1.59	1.73	1.86	2.12	2.39	2.65	2.92	3.19
3/8	1.92	2.08	2.23	2.55	2.87	3.19	3.51	3.83
7/16	2.23	2.42	2.60	2.98	3.35	3.72	4.09	4.46
1/2	2.55	2.72	2.98	3.40	3.83	4.25	4.67	5.10
9/16	2.87	3.11	3.35	3.83	4.30	4.78	5.26	5.74
5/8	3.19	3.46	3.72	4.25	4.78	5.31	5.84	6.38
11/16	3.51	3.80	4.09	4.67	5.26	5.84	6.43	7.02
3/4	3.83	4.15	4.47	5.10	5.75	6.38	7.02	7.65
13/16	4.14	4.49	4.84	5.53	6.21	6.90	7.60	8.29
7/8	4.47	4.84	5.20	5.95	6.69	7.44	8.18	8.93
15/16	4.78	5.18	5.58	6.38	7.18	7.97	8.77	9.57
1	5.10	5.53	5.95	6.80	7.65	8.50	9.35	10.20
1 1/8	5.74	6.22	6.70	7.65	8.61	9.57	10.52	11.48
1 1/4	6.38	6.91	7.44	8.50	9.57	10.63	11.69	12.75
1 3/8	7.02	7.60	8.18	9.35	10.52	11.69	12.85	14.03
1 1/2	7.65	8.29	8.93	10.20	11.48	12.75	14.03	15.30
1 5/8	8.29	8.98	9.67	11.05	12.43	13.81	15.19	16.58
1 3/4	8.93	9.67	10.42	11.90	13.40	14.88	16.37	17.85
1 7/8	9.57	10.36	11.15	12.75	14.34	15.94	17.53	19.13
2	10.20	11.05	11.90	13.60	15.30	17.00	18.70	20.40

WEIGHTS OF FLAT CARBON BAR STEEL—*Continued*
PER LINEAR FOOT

Conversion factors approximate: Tungsten High Speed Steel 1.11, Molybdenum High Speed Steels—Rex M-2 1.03, Rex VM and Rex TMO 1.01, Aluminum 0.346, Brass 1.07, Cast Iron 1.03, Copper and Bronze 1.128

	3¼	3½	3¾	4	4¼	4½	4¾	5
1/16	.691	.741	.80	.85	.90	.96	1.01	1.06
1/8	1.38	1.49	1.59	1.70	1.81	1.91	2.02	2.13
3/16	2.07	2.23	2.39	2.55	2.71	2.87	3.03	3.19
1/4	2.76	2.98	3.19	3.40	3.61	3.83	4.04	4.25
5/16	3.45	3.72	3.99	4.25	4.52	4.78	5.05	5.31
3/8	4.15	4.47	4.78	5.10	5.42	5.74	6.06	6.38
7/16	4.83	5.20	5.58	5.95	6.32	6.70	7.07	7.44
1/2	5.53	5.95	6.38	6.80	7.22	7.65	8.08	8.50
9/16	6.22	6.70	7.17	7.65	8.13	8.61	9.09	9.57
5/8	6.91	7.44	7.97	8.50	9.03	9.57	10.10	10.63
11/16	7.60	8.18	8.76	9.35	9.93	10.52	11.11	11.69
3/4	8.29	8.93	9.57	10.20	10.84	11.48	12.12	12.75
13/16	8.98	9.67	10.36	11.05	11.74	12.43	13.12	13.81
7/8	9.67	10.41	11.16	11.90	12.65	13.39	14.13	14.87
15/16	10.36	11.16	11.95	12.75	13.55	14.34	15.14	15.94
1	11.05	11.90	12.75	13.60	14.45	15.30	16.15	17.00
1 1/8	12.43	13.39	14.34	15.30	16.26	17.22	18.17	19.13
1 1/4	13.81	14.87	15.94	17.00	18.06	19.13	20.19	21.25
1 3/8	15.20	16.36	17.53	18.70	19.87	21.04	22.21	23.38
1 1/2	16.58	17.85	19.13	20.40	21.68	22.95	24.23	25.50
1 5/8	17.96	19.34	20.72	22.10	23.48	24.87	26.25	27.63
1 3/4	19.34	20.83	22.32	23.80	25.29	26.78	28.27	29.75
1 7/8	20.72	22.31	23.91	25.50	27.10	28.69	30.28	31.87
2	22.10	23.80	25.50	27.20	28.90	30.60	32.30	34.00

	5¼	5½	5¾	6	6¼	6½	6¾	7
1/16	1.12	1.17	1.22	1.27	1.33	1.38	1.43	1.49
1/8	2.23	2.34	2.44	2.55	2.66	2.76	2.87	2.98
3/16	3.35	3.51	3.67	3.83	3.99	4.14	4.30	4.46
1/4	4.46	4.67	4.89	5.10	5.31	5.53	5.74	5.95
5/16	5.58	5.84	6.11	6.38	6.64	6.90	7.17	7.44
3/8	6.69	7.02	7.34	7.65	7.97	8.29	8.61	8.93
7/16	7.81	8.18	8.56	8.93	9.29	9.67	10.04	10.41
1/2	8.93	9.35	9.77	10.20	10.63	11.05	11.48	11.90
9/16	10.04	10.52	11.00	11.48	11.95	12.43	12.91	13.39
5/8	11.16	11.69	12.22	12.75	13.28	13.81	14.34	14.87
11/16	12.27	12.85	13.44	14.03	14.61	15.20	15.78	16.36
3/4	13.39	14.03	14.67	15.30	15.94	16.58	17.22	17.85
13/16	14.50	15.19	15.88	16.58	17.27	17.95	18.65	19.34
7/8	15.62	16.36	17.10	17.85	18.60	19.34	20.08	20.83
15/16	16.74	17.53	18.33	19.13	19.92	20.72	21.51	22.32
1	17.85	18.70	19.55	20.40	21.25	22.10	22.95	23.80
1 1/8	20.08	21.04	21.99	22.95	23.91	24.87	25.82	26.78
1 1/4	22.32	23.38	24.44	25.50	26.56	27.62	28.69	29.75
1 3/8	24.54	25.71	26.88	28.05	29.22	30.39	31.56	32.72
1 1/2	26.78	28.05	29.33	30.60	31.88	33.15	34.43	35.70
1 5/8	29.01	30.39	31.77	33.15	34.53	35.91	37.99	38.67
1 3/4	31.24	32.73	34.22	35.70	37.19	38.68	40.17	41.65
1 7/8	33.47	35.06	36.65	38.25	38.85	41.44	43.03	44.63
2	35.70	37.40	39.10	40.80	42.50	44.20	45.90	47.60

*WEIGHTS OF TUNGSTEN HIGH SPEED STEEL

Diameter	1 Foot	1 Inch	⅛ Inch	Diameter	1 Foot	1 Inch	⅛ Inch
1/16	.011	.0009	.0001	3 3/16	30.09	2.5075	.3134
1/8	.046	.0038	.0005	1/4	31.28	2.6067	.3258
3/16	.103	.0086	.0011	5/16	32.49	2.7075	.3384
1/4	.185	.0154	.0019	3/8	33.73	2.8108	.3514
5/16	.289	.0241	.0030	7/16	34.99	2.9158	.3645
3/8	.416	.0347	.0043	1/2	36.28	3.0233	.3779
7/16	.566	.0472	.0059	9/16	37.58	3.1317	.3915
1/2	.741	.0618	.0077	5/8	38.91	3.2425	.4053
9/16	9.37	.0781	.0098	11/16	40.27	3.3558	.4195
5/8	1.16	.0967	.0121	3/4	41.64	3.4700	.4338
11/16	1.40	.1167	.0146	13/16	43.04	3.5867	.4483
3/4	1.67	.1392	.0174	7/8	44.47	3.7058	.4632
13/16	1.95	.1625	.0203	15/16	45.91	3.8258	.4782
7/8	2.27	.1892	.0237				
15/16	2.60	.2167	.0271	4	47.38	3.9483	.4935
				1/16	48.87	4.0725	.5091
1	2.96	.2467	.0308	1/8	50.39	4.1992	.5249
1/16	3.34	.2783	.0348	3/16	51.93	4.3275	.5409
1/8	3.75	.3125	.0391	1/4	53.49	4.4575	.5572
3/16	4.18	.3483	.0435	5/16	55.07	4.5892	.5737
1/4	4.63	.3858	.0482	3/8	56.68	4.7233	.5904
5/16	5.10	.4250	.0531	7/16	58.31	4.8592	.6074
3/8	5.60	.4667	.0583	1/2	59.97	4.9975	.6246
7/16	6.12	.5100	.0638	9/16	61.64	5.1367	.6421
1/2	6.66	.5550	.0694	5/8	63.34	5.2783	.6598
9/16	7.23	.6025	.0753	11/16	65.07	5.4225	.6778
5/8	7.82	.6517	.0815	3/4	66.81	5.5675	.6959
11/16	8.43	.7025	.0878	13/16	68.58	5.7150	.7144
3/4	9.07	.7558	.0945	7/8	70.38	5.8650	.7331
13/16	9.73	.8108	.1014	15/16	72.19	6.0158	.7520
7/8	10.41	.8675	.1084				
15/16	11.12	.9267	.1158	5	74.03	6.1692	.7712
				1/8	77.78	6.4817	.8102
2	11.85	.9875	.1234	1/4	81.62	6.8017	.8502
1/16	12.60	1.0500	.1313	3/8	85.55	7.1292	.8912
1/8	13.37	1.1142	.1393	1/2	89.58	7.4650	.9331
3/16	14.17	1.1808	.1476	5/8	93.70	7.8083	.9760
1/4	14.99	1.2492	.1562	3/4	97.91	8,1592	1.0199
5/16	15.84	1.3200	.1650	7/8	102.21	8.5175	1.0647
3/8	16.70	1.3917	.1740				
7/16	17.59	1.4658	.1832	6	106.61	8.8842	1.1105
1/2	18.51	1.5425	.1928	1/8	111.09	9.2575	1.1572
9/16	19.45	1.6208	.2026	1/4	115.67	9.6392	1.2049
5/8	20 41	1.7008	.2126	3/8	120.36	10.0300	1.2538
11/16	21.39	1.7825	.2228	1/2	125.11	10.4258	1.3032
3/4	22.39	1.8658	.2332	5/8	129.97	10.8308	1.3539
13/16	23.42	1.9517	.2440	3/4	134.92	11.2433	1.4050
7/8	24.48	2.0400	.2550	7/8	139.97	11.6642	1.4580
15/16	25.55	2.1292	.2662				
				7	145.10	12.0917	1.5115
3	26.65	2.2208	.2776	1/8	150.33	12.5275	1.5659
1/16	27.79	2.3158	.2895	1/4	155.65	12.9708	1.6214
1/8	28.92	2.4100	.3013				

* These weights shown are Rex AA tungsten type high speed steel. Approximate weights of molybdenum high speed steels are as follows: Rex M-2 93% and Rex VM and Rex TMO 91% of above weights.

*WEIGHTS OF TUNGSTEN HIGH SPEED STEEL —Continued

Diameter	1 Foot	1 Inch	1/8 Inch	Diameter	1 Foot	1 Inch	1/8 Inch
7 3/8	161.07	13.4225	1.6778	11	358.31	29.8592	3.7324
1/2	166.57	13.8808	1.7351	1/4	374.79	31.2325	3.9041
5/8	172.17	14.3473	1.7934	1/2	391.63	32.6358	4.0795
3/4	177.86	14.8217	1.8527	3/4	408.84	34.0700	4.2588
7/8	183.65	15.3042	1.9130				
				12	426.42	35.5350	4.4419
8	189.52	15.7933	1.9742	1/4	444.38	37.0317	4.6290
1/8	195.49	16.2908	2.0364	1/2	462.70	38.5583	4.8198
1/4	201.55	16.7958	2.0995	3/4	481.39	40.1158	5.0145
3/8	207.71	17.3092	2.1637				
1/2	213.95	17.8292	2.2287	13	500.45	41.7042	5.2130
5/8	220.29	18.3575	2.2947	1/4	519.89	43.3242	5.4155
3/4	226.72	18.8933	2.3617	1/2	539.69	44.9742	5.6218
7/8	233.25	19.4375	2.4297	3/4	559.87	46.6558	5.8320
9	239.86	19.9883	2.4985	14	580.41	48.3675	6.0459
1/4	253.37	21.1142	2.6393	1/4	601.32	50.1100	6.2638
1/2	267.26	22.2717	2.7840	1/2	622.61	51.8842	6.4855
3/4	281.51	23.4592	2.9324	3/4	644.26	53.6883	6.7110
10	296.13	24.6775	3.0847	15	666.29	55.5242	6.9405
1/4	311.12	25.9267	3.2408	1/4	688.68	57.3900	7.1738
1/2	326.48	27.2067	3.4008	1/2	711.45	59.2875	7.4109
3/4	342.21	28.5175	3.5647				

* These weights shown are Rex AA tungsten type high speed steel. Approximate weights of molybdenum high speed steels are as follows: Rex M-2 93% and Rex VM and Rex TMO 91% of above weights.

**WEIGHTS OF TUNGSTEN HIGH SPEED TOOL BITS

Square	Length	Approximate Number Per Pound
3/16	2 1/2 Long	36 Bits
1/4	2 1/2 "	20 "
5/16	2 1/2 "	13 "
3/8	3 "	8 "
7/16	3 1/2 "	5 "
1/2	4 "	3 "
9/16	4 "	3 "
5/8	4 1/2 "	2 "
3/4	5 "	1 Bit, approx. 7/8 lb.
7/8	6 "	1 " " 1 1/2 "
1	7 "	1 " " 2 1/8 "

** High speed tool bits are available in any quantity. They are usually packed in 5 lb. boxes of a size or assorted sizes.

WEIGHTS OF HIGH SPEED DRILL RODS

*Size — Decimal Equivalent — Weight (Tungsten Type)

Size	*Decimal*	*Weight Pounds Per Foot*	*Size*	*Decimal*	*Weight Pounds Per Foot*
1 1/2	1.500	6.664	45/64	.7031	1.464
1 31/64	1.4843	6.526	11/16	.6875	1.400
1 15/32	1.4687	6.389	43/64	.6718	1.330
1 29/64	1.4531	6.255	21/32	.6562	1.275
1 7/16	1.4375	6.121	41/64	.6406	1.213
1 27/64	1.4218	5.987	5/8	.625	1.157
1 13/32	1.4062	5.856	39/64	.6093	1.099
1 25/64	1.3906	5.728	19/32	.5937	1.045
1 3/8	1.375	5.600	37/64	.5781	.990
1 23/64	1.3593	5.473	9/16	.5625	.937
1 11/32	1.3437	5.349	35/64	.5468	.880
1 21/64	1.3281	5.225	17/32	.5312	.836
1 5/16	1.3125	5.103	33/64	.5156	.786
1 19/64	1.2968	4.982	1/2	.500	.733
1 9/32	1.2812	4.862	31/64	.4843	.687
1 17/64	1.2656	4.744	15/32	.4687	.644
1 1/4	1.250	4.629	29/64	.4531	.602
1 15/64	1.2343	4.513	7/16	.4375	.562
1 7/32	1.2187	4.399	27/64	.4218	.520
1 13/64	1.2031	4.287	Z	.413	.500
1 3/16	1.1875	4.177	13/32	.4062	.484
1 11/64	1.1718	4.067	Y	.404	.479
1 5/32	1.1562	3.959	X	.397	.463
1 9/64	1.1406	3.854	25/64	.3906	.448
1 1/8	1.125	3.748	W	.386	.444
1 7/64	1.1093	3.645	V	.377	.425
1 3/32	1.0937	3.539	3/8	.375	.416
1 5/64	1.0781	3.442	U	.368	.401
1 1/16	1.0625	3.343	23/64	.3593	.382
1 3/64	1.0468	3.241	T	.358	.380
1 1/32	1.0312	3.148	S	.348	.361
1 1/64	1.0156	3.051	11/32	.3437	.350
1	1.000	2.961	R	.339	.342
63/64	.9843	2.868	Q	.332	.326
31/32	.9687	2.779	21/64	.3281	.319
61/64	.9531	2.691	P	.323	.307
15/16	.9375	2.603	O	.316	.295
59/64	.9218	2.513	5/16	.3125	.288
29/32	.9062	2.433	N	.302	.269
57/64	.8906	2.347	19/64	.2968	.260
7/8	.875	2.268	M	.295	.259
55/64	.8593	2.178	L	.290	.250
27/32	.8437	2.109	9/32	.2812	.235
53/64	.8281	2.031	K	.281	.234
13/16	.8125	1.956	J	.277	.228
51/64	.7968	1.877	I	.272	.220
25/32	.7812	1.808	H	.266	.209
49/64	.7656	1.734	17/64	.2656	.209
3/4	.750	1.666	G	.261	.201
47/64	.7343	1.596	F	.257	.193
23/32	.7187	1.531	E	.250	.185

* These weights shown are for Rex AA tungsten type drill rods. Approximate weights of molybdenum high speed drill rods are as follows: Rex M-2 93% and Rex VM and Rex TMO 91% of above weights.

WEIGHTS OF HIGH SPEED DRILL RODS—*Continued*

***Size — Decimal Equivalent — Weight (Tungsten Type)**

Size	*Decimal*	*Weight Pounds Per Foot*	*Size*	*Decimal*	*Weight Pounds Per Foot*
1/4	.250	.185	38	.1015	.031
D	.246	.179	39	.0995	.029
C	.242	.171	40	.098	.028
B	.238	.167	41	.096	.027
15/64	.2343	.163	3/32	.0937	.026
A	.234	.162	42	.0935	.026
1	.228	.153	43	.089	.022
2	.221	.145	44	.086	.021
7/32	.2187	.143	45	.082	.020
3	.213	.134	46	.081	.019
4	.209	.128	47	.0785	.018
5	.2055	.121	5/64	.0781	.018
6	.204	.121	48	.076	.017
13/64	.2031	.119	49	.073	.016
7	.201	.118	50	.070	.014
8	.199	.115	51	.067	.013
9	.196	.110	52	.0635	.012
10	.1935	.107	1/16	.0625	.011
11	.191	.104	53	.0595	.010
12	.189	.104	54	.055	.0089
3/16	.1875	.102	55	.052	.0078
13	.185	.099	56	.0465	.0066
14	.182	.097	57	.043	.0052
15	.180	.094	58	.042	.0050
16	.177	.091	59	.041	.0047
17	.173	.088	60	.040	.0044
11/64	.1718	.088	61	.039	.0042
18	.1695	.084	62	.038	.0041
19	.166	.079	63	.037	.0039
20	.161	.077	64	.036	.0037
21	.159	.073	65	.035	.0032
22	.157	.073	66	.033	.0030
5/32	.1562	.072	67	.032	.0028
23	.154	.070	68	.031	.0027
24	.152	.068	69	.02925	.0026
25	.1495	.065	70	.028	.0022
26	.147	.063	71	.026	.0020
27	.144	.061	72	.025	.0017
9/64	.1406	.058	73	.024	.0016
28	.1405	.057	74	.0225	.0014
29	.136	.053	75	.021	.0012
30	.1285	.048	76	.020	.0009
1/8	.125	.047	77	.018	.0007
31	.120	.043	78	.016	.0006
32	.116	.040	79	.0145	.0005
33	.113	.038	80	.0135	.0004
34	.111	.036			
35	.110	.034			
7/64	.1093	.034			
36	.1065	.033			
37	.104	.032			

* These weights shown are for Rex AA tungsten type drill rods. Approximate weights of molybdenum high speed drill rods are as follows: Rex M-2 93% and Rex VM and Rex TMO 91% of above weights.

WEIGHTS OF DRILL RODS

*Size — Decimal Equivalent — Weight (Victor and Carbon Tool Types)

Size	*Decimal*	*Weight Pounds Per Foot*	*Approx. Wt. Per 3 Foot Bar*	*Size*	*Decimal*	*Weight Pounds Per Foot*	*Approx. Wt. Per 3 Foot Bar*
1 1/2	1.5000	6.004	18.0	23/32	.7187	1.379	4.14
1 31/64	1.4843	5.879	17.6	45/64	.7031	1.319	3.96
1 15/32	1.4687	5.756	17.3	11/16	.6875	1.261	3.78
1 29/64	1.4531	5.635	16.9	43/64	.6718	1.201	3.60
1 7/16	1.4375	5.514	16.5	21/32	.6562	1.149	3.44
1 27/64	1.4218	5.394	16.2	41/64	.6406	1.093	3.28
1 13/32	1.4062	5.276	15.8	5/8	.625	1.042	3.13
1 25/64	1.3906	5.160	15.5	39/64	.6093	.990	2.97
1 3/8	1.375	5.045	15.1	19/32	.5937	.941	2.82
1 23/64	1.3593	4.931	14.8	37/64	.5781	.892	2.68
1 11/32	1.3437	4.819	14.5	9/16	.5625	.844	2.53
1 21/64	1.3281	4.707	14.1	35/64	.5468	.793	2.38
1 5/16	1.3125	4.597	13.8	17/32	.5312	.753	2.26
1 19/64	1.2968	4.488	13.5	33/64	.5156	.708	2.12
1 9/32	1.2812	4.380	13.1	1/2	.500	.667	2.00
1 17/64	1.2656	4.274	12.8	31/64	.4843	.625	1.88
1 1/4	1.250	4.170	12.5	15/32	.4687	.583	1.75
1 15/64	1.2343	4.066	12.2	29/64	.4531	.542	1.63
1 7/32	1.2187	3.963	11.9	7/16	.4375	.510	1.53
1 13/64	1.2031	3.862	11.6	27/64	.4218	.472	1.42
1 3/16	1.1875	3.763	11.3	Z	.413	.458	1.37
1 11/64	1.1718	3.664	11.0	13/32	.4062	.440	1.32
1 5/32	1.1562	3.567	10.7	Y	.404	.437	1.31
1 9/64	1.1406	3.472	10.4	X	.397	.421	1.26
1 1/8	1.125	3.377	10.1	25/64	.3906	.408	1.22
1 7/64	1.1093	3.284	9.85	W	.386	.400	1.20
1 3/32	1.0937	3.188	9.56	V	.377	.383	1.15
1 5/64	1.0781	3.101	9.30	3/8	.375	.375	1.12
1 1/16	1.0625	3.012	9.04	U	.368	.362	1.09
1 3/64	1.0468	2.920	8.76	23/64	.3593	.344	1.03
1 1/32	1.0312	2.836	8.51	T	.358	.342	1.02
1 1/64	1.0156	2.749	8.25	S	.348	.325	.98
1	1.000	2.668	8.00	11/32	.3437	.315	.95
63/64	.9843	2.584	7.75	R	.339	.308	.92
31/32	.9687	2.504	7.51	Q	.332	.294	.88
61/64	.9531	2.424	7.27	21/64	.3281	.287	.86
15/16	.9375	2.345	7.04	P	.323	.277	.83
59/64	.9218	2.264	6.79	O	.316	.266	.80
29/32	.9062	2.192	6.58	5/16	.3125	.261	.78
57/64	.8906	2.114	6.34	N	.302	.242	.73
7/8	.875	2.043	6.13	19/64	.2968	.234	.70
55/64	.8593	1.969	5.91	M	.295	.233	.70
27/32	.8437	1.900	5.70	L	.290	.225	.68
53/64	.8281	1.830	5.49	9/32	.2812	.212	.64
13/16	.8125	1.762	5.29	K	.281	.212	.64
51/64	.7968	1.691	5.07	J	.277	.205	.62
25/32	.7812	1.629	4.89	I	.272	.198	.59
49/64	.7656	1.562	4.69	H	.266	.188	.56
3/4	.750	1.501	4.50	17/64	.2656	.188	.56
47/64	.7343	1.438	4.31	G	.261	.181	.54

* IMPORTANT—The figures in this table correspond to Stubs' Steel Wire Gauge, which is commonly used for all tool steel or alloy steel drill rod sizes. Morse Twist Drill Gauge is commonly used for high speed steel and varies slightly from figures shown in above tables. The gauges and weights of high speed drill rod are shown on pages 131 and 132.

WEIGHTS OF DRILL RODS—*Continued*

***Size — Decimal Equivalent — Weight (Victor and Carbon Tool Types)**

Size	*Decimal*	*Weight Pounds Per Foot*	*Approx. Wt. Per 3 Foot Bar*	*Size*	*Decimal*	*Weight Pounds Per Foot*	*Approx. Wt. Per 3 Foot Bar*
F	.257	.174	.52	35	.108	.031	.093
E	.250	.167	.50	36	.106	.030	.090
1/4	.250	.167	.50	37	.103	.029	.087
D	.246	.161	.47	38	.101	.028	.084
C	.242	.154	.46	39	.099	.026	.078
B	.238	.150	.45	40	.097	.025	.075
15/64	.2343	.147	.44	41	.095	.024	.072
A	.234	.147	.44	3/32	.0937	.023	.069
1	.227	.138	.41	42	.092	.023	.069
2	.219	.129	.39	43	.088	.021	.063
7/32	.2187	.129	.39	44	.085	.019	.057
3	.212	.121	.36	45	.081	.018	.054
4	.207	.115	.35	46	.079	.017	.051
5	.204	.109	.33	5/64	.0781	.016	.048
13/64	.2031	.109	.33	47	.077	.016	.048
6	.201	.107	.32	48	.075	.015	.045
7	.199	.106	.32	49	.072	.014	.042
8	.197	.104	.31	50	.069	.013	.039
9	.194	.099	.30	51	.066	.012	.036
10	.191	.096	.29	52	.063	.011	.033
11	.188	.094	.28	1/16	.0625	.010	.030
3/16	.1875	.094	.28	53	.058	.009	.027
12	.185	.092	.28	54	.055	.008	.024
13	.182	.089	.27	55	.050	.007	.021
14	.180	.087	.26	3/64	.0468	.006	.018
15	.178	.085	.26	56	.045	.006	.018
16	.175	.082	.25	57	.042	.005	.015
17	.172	.079	.24	58	.041	.0045	.0135
11/64	.1718	.079	.24	59	.040	.0043	.0129
18	.168	.076	.23	60	.039	.0040	.0120
19	.164	.072	.22	61	.038	.0038	.0114
20	.161	.069	.21	62	.037	.0037	.0111
21	.157	.066	.20	63	.036	.0035	.0105
5/32	.1562	.066	.20	64	.035	.0033	.0099
22	.155	.065	.20	65	.033	.0029	.0087
23	.153	.063	.19	66	.032	.0027	.0081
24	.151	.061	.18	1/32	.0312	.0027	.0081
25	.148	.059	.177	67	.031	.0025	.0075
26	.146	.057	.171	68	.030	.0024	.0072
27	.143	.055	.165	69	.029	.0023	.0069
9/64	.1406	.052	.156	70	.027	.0020	.0060
28	.139	.052	.156	71	.026	.0018	.0054
29	.134	.048	.144	72	.024	.0015	.0045
30	.127	.043	.129	73	.023	.0014	.0042
1/8	.125	.042	.126	74	.022	.0013	.0039
31	.120	.039	.117	75	.020	.0011	.0033
32	.115	.036	.108	76	.018	.0009	.0027
33	.112	.034	.102	77	.016	.0007	.0021
34	.110	.032	.096	1/64	.0156	.0007	.0021
7/64	.1093	.031	.093	78	.015	.0006	.0018
				79	.014	.0005	.0015
				80	.013	.0004	.0012

* IMPORTANT—The figures in this table correspond to Stubs' Steel Wire Gauge, which is commonly used for all tool steel or alloy steel drill rod sizes. Morse Twist Drill Gauge is commonly used for high speed steel and varies slightly from figures shown in above tables. The gauges and weights of high speed drill rod are shown on pages 131 and 132.

FRACTIONS OF AN INCH AND DECIMAL EQUIVALENTS

1/64	.015625
1/32	.03125
3/64	.046875
1/16	.0625
5/64	.078125
3/32	.09375
7/64	.109375
1/8	.125
9/64	.140625
5/32	.15625
11/64	.171875
3/16	.1875
13/64	.203125
7/32	.21875
15/64	.234375
1/4	.250
17/64	.265625
9/32	.28125
19/64	.296875
5/16	.3125
21/64	.328125
11/32	.34375
23/64	.359375
3/8	.375
25/64	.390625
13/32	.40625
27/64	.421875
7/16	.4375
29/64	.453125
15/32	.46875
31/64	.484375
1/2	.500
33/64	.51562
17/32	.53125
35/64	.54687
9/16	.5625
37/64	.578125
19/32	.59375
39/64	.609375
5/8	.625
41/64	.640625
21/32	.65625
43/64	.671875
11/16	.6875
45/64	.703125
23/32	.71875
47/64	.734375
3/4	.750
49/64	.765625
25/32	.78125
51/64	.796875
13/16	.8125
53/64	.828125
27/32	.84375
55/64	.859375
7/8	.875
57/64	.890625
29/32	.90625
59/64	.921875
15/16	.9375
61/64	.953125
31/32	.96875
63/64	.984375
1	1.0000

STANDARD GAUGES

Dimensions of Sizes in Decimal Parts of an Inch

Number of Wire Gauge	*American or Brown & Sharpe*	*Birmingham or Stubs' Iron Wire*	*U. S. Standard Gauge for Sheet and Plate Iron and Steel (Revised)*	*Washburn & Moen, or Steel Wire Gauge*	*Music Wire Gauge*	*Stubs' Steel Wire*
00000000						
0000000			.50	.4900		
000000	.580		.46875	.4615	.004	
00000	.5165		.4375	.4305	.005	
0000	.460	.454	.40625	.3938	.006	
000	.409642	.425	.375	.3625	.007	
00	.364796	.380	.34375	.3310	.008	
0	.324861	.340	.3125	.3065	.009	
1	.289297	.300	.28125	.2830	.010	.227
2	.257627	.284	.26563	.2625	.011	.219
3	.229423	.259	.250	.2437	.012	.212
4	.204307	.238	.23438	.2253	.013	.207
5	.18194	.220	.21875	.2070	.014	.204
6	.162023	.203	.20313	.1920	.016	.201
7	.144285	.180	.1875	.1770	.018	.199
8	.12849	.165	.17188	.1620	.020	.197
9	.114423	.148	.15625	.1483	.022	.194
10	.101897	.134	.14063	.1350	.024	.191
11	.090742	.120	.125	.1205	.026	.188
12	.080808	.109	.10938	.1055	.029	.185
13	.071962	.095	.09375	.0915	.031	.182
14	.064084	.083	.07813	.0800	.033	.180
15	.057068	.072	.07031	.0720	.035	.178
16	.050821	.065	.0625	.0625	.037	.175
17	.045257	.058	.05625	.0540	.039	.172
18	.040303	.049	.050	.0475	.041	.168
19	.03589	.042	.04375	.0410	.043	.164
20	.031961	.035	.0375	.0348	.045	.161
21	.028462	.032	.03438	.03175	.047	.157
22	.025346	.028	.03125	.0286	.049	.155
23	.022572	.025	.02813	.0258	.051	.153
24	.020101	.022	.025	.0230	.055	.151
25	.0179	.020	.02188	.0204	.059	.148
26	.015941	.018	.01875	.0181	.063	.146
27	.014195	.016	.01719	.0173	.067	.143
28	.012641	.014	.01563	.0162	.071	.139
29	.011257	.013	.01406	.0150	.075	.134
30	.010025	.012	.0125	.0140	.080	.127
31	.008928	.010	.01094	.0132	.085	.120
32	.00795	.009	.01016	.0128	.090	.115
33	.00708	.008	.00938	.0118	.095	.112
34	.006305	.007	.00859	.0104		.110
35	.005615	.005	.00781	.0095		.108
36	.005	.004	.00703	.0090		.106
37	.004453		.00664	.0085		.103
38	.003965		.00625	.0080		.101
39	.003531			.0075		.099
40	.003144			.0070		.097

WEIGHTS OF IRON AND CARBON STEEL

*STANDARD GAUGES

(For estimated weights of stainless plates and sheets, see page 139)

No. of Gauge	U. S. STANDARD GAUGE				BIRMINGHAM GAUGE			
	Thickness in Inches		Weight Square Foot		No. of Gauge	Thickness in Ins.	Weight Square Foot	
	Fractions	Decimals	Iron	Steel			Iron	Steel
7-0's	1/2	.5	20.00	20.4	------	------	------	------
6-0's	15/32	.46875	18.75	19.125	------	------	------	------
5-0's	7/16	.4375	17.50	17.85	------	------	------	------
0000	13/32	.40625	16.25	16.575	0000	.454	18.22	18.523
000	3/8	.375	15.	15.30	000	.425	17.05	17.34
00	11/32	.34375	13.75	14.025	00	.38	15.25	15.504
0	5/16	.3125	12.50	12.75	0	.34	13.64	13.872
1	9/32	.28125	11.25	11.475	1	.3	12.04	12.24
2	17/64	.26562	10.625	10.8375	2	.284	11.40	11.587
3	1/4	.25	10.	10.2	3	.259	10.39	10.567
4	15/64	.23438	9.375	9.5625	4	.238	9.55	9.710
5	7/32	.21875	8.75	8.925	5	.22	8.83	8.976
6	13/64	.20313	8.125	8.2875	6	.203	8.15	8.282
7	3/16	.1875	7.5	7.65	7	.18	7.22	7.344
8	11/64	.17188	6.875	7.0125	8	.165	6.62	6.732
9	5/32	.15625	5.25	6.375	9	.148	5.94	6.038
10	9/64	.14063	5.625	5.7375	10	.134	5.38	5.467
11	1/8	.125	5.	5.1	11	.12	4.82	4.896
12	7/64	.10938	4.375	4.4625	12	.109	4.37	4.497
13	3/32	.09375	3.75	3.825	13	.095	3.81	3.876
14	5/64	.07813	3.125	3.1875	14	.083	3.33	3.386
15	9/128	.07031	2.8125	2.86875	15	.072	2.89	2.938
16	1/16	.0625	2.5	2.55	16	.065	2.61	2.651
17	9/160	.05625	2.25	2.295	17	.058	2.33	2.366
18	1/20	.05	2.	2.04	18	.049	1.97	1.999
19	7/160	.04375	1.75	1.785	19	.042	1.69	1.714
20	3/80	.0375	1.50	1.53	20	.035	1.40	1.428
21	11/320	.03438	1.375	1.4025	21	.032	1.28	1.306
22	1/32	.03125	1.25	1.275	22	.028	1.12	1.142
23	9/320	.02813	1.125	1.1475	23	.025	1.00	1.02
24	1/40	.025	1.	1.02	24	.022	.883	.898
25	7/320	.02188	.875	.8925	25	.02	.803	.816
26	3/160	.01875	.75	.765	26	.018	.722	.734
27	11/640	.01719	.6875	.70125	27	.016	.642	.653
28	1/64	.01563	.625	.6375	28	.014	.562	.571
29	9/640	.01406	.5625	.57375	29	.013	------	.530
30	1/80	.0125	.5	.51	30	.012	------	.49
31	7/640	.01094	.4375	.34625	31	.01	------	.408
32	13/1280	.01016	.4063	.41438	32	.009	------	.367
33	3/320	.00938	.375	.3825	33	.008	------	.326
34	11/1280	.00859	.3438	.35063	34	.007	------	.286
35	5/640	.00781	.3125	.31875	35	.005	------	.204
36	9/1280	.00703	.2813	.28688	36	.004	------	.163
37	17/2560	.00664	.2657	.27094	------	------	------	------
38	1/160	.00625	.25	.255	------	------	------	------

*Sheet mills roll iron and steel sheets to U. S. Standard Gauge. Plate mills usually roll to Birmingham Gauge unless otherwise ordered. Bands and hoops, cold rolled strip steel and spring steel are rolled to Birmingham Gauge. Round wire is drawn to Washburn and Moen Gauge.

STAINLESS STEEL SHEETS

WEIGHTS OF STAINLESS STEEL SHEETS

Thickness Ordering Range Inches	*Gauge Number*	*Approximate Decimal Parts of an inch*	*Average Wt. per Sq. Ft. in Lbs. for Chr. Iron Alloys*	*Average Wt. per Sq. Ft. in Lbs. for Chr. Nickel—Cold Rolled Alloys*
.161 to .176	8	.171875	7.0813	7.2187
.146 to .160	9	.15625	6.4375	6.5625
.131 to .145	10	.140625	5.7937	5.9062
.115 to .130	11	.125	5.15	5.2500
.099 to .114	12	.109375	4.5063	4.5937
.084 to .098	13	.09375	3.8625	3.9375
.073 to .083	14	.078125	3.2187	3.2812
.066 to .072	15	.0703125	2.8968	2.9531
.059 to .065	16	.0625	2.575	2.6250
.053 to .058	17	.05625	2.3175	2.3625
.047 to .052	18	.050	2.06	2.1000
.041 to .046	19	.04375	1.8025	1.8375
.036 to .040	20	.0375	1.545	1.5750
.033 to .035	21	.034375	1.416	1.4437
.030 to .032	22	.03125	1.2875	1.3125
.027 to .029	23	.028125	1.1587	1.1813
.024 to .026	24	.025	1.03	1.0500
.0199 to .023	25	.021875	.9013	.9187
.0178 to .0198	26	.01875	.7725	.7875
.0161 to .0177	27	.0171875	.7081	.7218
.0146 to .0160	28	.015625	.6438	.6562
.0131 to .0145	29	.0140625	.5794	.5906
.0115 to .0130	30	.0125	.515	.5250
.0105 to .0114	31	.0109375	.4506	.4594
.0095 to .0104	32	.01015625	.4184	.4265

DRILL STEELS

WEIGHTS OF HOLLOW DRILL STEEL

PER LINEAR FOOT IN POUNDS

Size	*Weight*	*Hole Size, Diam.*
⅞ Hexagon	2.05	17/64
1 "	2.55	17/64
1⅛ "	3.35	11/32
1¼ "	4.10	11/32
1 Round	2.50	17/64
1⅛ "	3.07	11/32
1¼ "	3.85	11/32
1½ "	5.18	½
⅞ Quarter Octagon	2.30	17/64
1 " "	2.98	17/64

WEIGHTS OF SOLID DRILL STEEL

PER LINEAR FOOT IN POUNDS

Size	*Octagon*	*Hexagon*	*Rounds*	*Qr. Oct.*	*Cruciform (R.M.P.)*
½	.70	.75	.67	.82	-----
⅝	1.10	1.17	1.04	1.29	-----
¾	1.58	1.68	1.50	1.85	1.16
⅞	2.16	2.29	2.04	2.50	1.63
1	2.82	2.99	2.67	3.25	2.31
1⅛	3.56	3.78	3.38	4.10	2.72
1¼	4.40	4.66	4.17	5.10	3.30
1⅜	5.32	5.65	5.05	6.15	3.95
1½	6.34	6.72	6.01	7.30	4.77
1⅝	7.32	7.89	7.05	8.55	5.52
1¾	8.64	9.14	8.18	9.95	6.29
1⅞	9.92	10.50	9.38	11.30	6.97
2	11.28	11.95	10.71	13.30	7.96
2¼	14.24	15.12	13.60	16.40	9.53
2½	17.65	18.66	16.68	20.20	11.58

LENGTH CONVERSIONS

Based on Value 1 m. = 39.37 in.

In. = / *Mm.* = / *Feet* = / *M.* = / *Yd.* = / *Miles* = / *Km.* =	*millimeters*	*inches*	*meters*	*feet*	*meters*	*yards*	*kilometers*	*miles*
1	25.400 1	0.039 370	0.304 801	3.280 83	0.914 402	1.093 61	1.609 35	0.621 37
2	50.800 1	0.078 740	0.609 601	6.561 67	1.828 80	2.187 22	3.218 69	1.242 74
3	76.200 2	0.118 110	0.914 402	9.842 50	2.743 21	3.280 83	4.828 04	1.864 11
4	101.600	0.157 480	1.219 20	13.123 3	3.657 61	4.374 44	6.437 39	2.485 48
5	127.000	0.196 850	1.524 00	16.404 2	4.572 01	5.468 06	8.046 74	3.106 85
6	152.400	0.236 220	1.828 80	19.685 0	5.486 41	6.561 67	9.656 08	3.728 22
7	177.800	0.275 590	2.133 60	22.965 8	6.400 81	7.655 28	11.265 4	4.349 59
8	203.200	0.314 960	2.438 40	26.246 7	7.315 21	8.748 89	12.874 8	4.970 96
9	228.600	0.354 330	2.743 21	29.527 5	8.229 62	9.842 50	14.484 1	5.592 33
10	254.001	0.393 700	3.048 01	32.808 3	9.144 02	10.936 1	16.093 5	6.213 70
11	279.401	0.433 070	3.352 81	36.089 2	10.058 4	12.029 7	17.702 8	6.835 07
12	304.801	0.472 440	3.657 61	39.370 0	10.972 8	13.123 3	19.312 2	7.456 44
13	330.201	0.511 810	3.962 41	42.650 8	11.887 2	14.216 9	20.921 5	8.077 81
14	355.601	0.551 180	4.267 21	45.931 7	12.801 6	15.310 6	22.530 9	8.699 18
15	381.001	0.590 550	4.572 01	49.212 5	13.716 0	16.404 2	24.140 2	9.320 55
16	406.401	0.629 920	4.876 81	52.943 3	14.630 4	17.497 8	25.749 6	9.941 92
17	431.801	0.669 290	5.181 61	55.774 2	15.544 8	18.591 4	27.358 9	10.563 3
18	457.201	0.708 660	5.486 41	59.005 0	16.459 2	19.685 0	28.968 2	11.184 7
19	482.601	0.748 030	5.791 21	62.335 8	17.373 6	20.778 6	30.577 6	11.806 0
20	508.001	0.787 400	6.096 01	65.616 7	18.288 0	21.872 2	32.186 9	12.427 4
21	533.401	0.826 770	6.400 81	68.896 5	19.202 4	22.965 8	33.196 3	13.048 8
22	558.801	0.866 140	6.705 61	72.178 3	20.116 8	24.059 4	35.405 6	13.670 1
23	584.201	0.905 510	7.010 41	75.459 2	21.031 2	25.153 1	37.015 0	14.291 5
24	609.601	0.944 880	7.315 21	78.740 0	21.945 6	26.246 7	38.624 3	14.912 9
25	635.001	0.984 250	7.620 02	82.020 8	22.860 0	27.340 3	40.233 7	15.534 2
26	660.401	1.023 62	7.924 82	85.301 7	23.774 4	28.433 9	41.843 0	16.155 6
27	685.801	1.062 99	8.229 62	88.582 5	24.688 9	29.527 5	43.452 4	16.777 0
28	711.201	1.102 36	8.534 42	91.863 3	25.603 3	30.621 1	45.061 7	17.398 4
29	736.601	1.141 73	8.939 22	95.144 2	26.517 7	31.714 7	46.671 1	18.019 7
30	762.002	1.181 10	9.144 02	98.425 0	27.432 1	32.808 3	48.280 4	18.641 1
31	787.402	1.220 47	9.448 82	101.706	28.346 5	33.901 9	49.889 8	19.262 5
32	812.802	1.259 84	9.753 62	104.987	29.260 9	34.995 6	51.499 1	19.883 8
33	838.202	1.299 21	10.058 4	108.268	30.175 3	36.089 2	53.108 5	20.505 2
34	863.602	1.338 58	10.363 2	111.548	31.089 7	37.182 8	54.717 8	21.126 6
35	889.002	1.377 95	10.668 0	114.829	32.004 1	38.276 4	56.327 2	21.747 9
36	914.402	1.417 32	10.972 8	118.110	32.918 5	39.370 0	57.936 5	22.369 3
37	939.802	1.456 69	11.277 6	121.391	33.832 9	40.463 6	59.545 8	22.990 7
38	965.202	1.496 06	11.582 4	124.672	34.747 3	41.557 2	61.155 2	23.612 1
39	990.602	1.535 43	11.887 2	127.953	35.661 7	42.650 8	62.764 5	24.233 4
40	1 016.00	1.574 80	12.192 0	131.233	36.576 1	43.744 4	64.373 9	24.854 8
41	1 041.40	1.614 17	12.496 8	134.514	37.490 5	44.838 1	65.983 2	25.476 2
42	1 066.80	1.653 54	12.801 6	137.795	38.404 9	45.931 7	67.592 6	26.097 5
43	1 092.20	1.692 91	13.106 4	141.076	39.319 3	47.025 3	69.201 9	26.718 9
44	1 117.60	1.732 28	13.411 2	144.357	40.233 7	48.118 9	70.811 3	27.340 3
45	1 143.00	1.771 65	12.716 0	147.638	41.148 1	49.212 5	72.420 6	27.961 6
46	1 168.40	1.811 02	14.020 8	150.918	42.062 5	50.306 1	74.030 0	28.583 0
47	1 193.80	1.850 39	14.325 6	154.199	42.976 9	51.399 7	75.639 3	29.204 4
48	1 219.20	1.889 76	14.630 4	157.480	43.891 3	52.493 3	77.248 7	29.825 8
49	1 244.60	1.929 13	14.935 2	160.761	44.805 7	53.586 9	78.858 0	30.447 1
50	1 270.00	1.968 50	15.240 0	164.042	45.720 1	54.680 6	80.467 4	31.068 5

From "Ready Reference Tables," courtesy Carl Hering.

LENGTH CONVERSIONS—*Continued*

Based on Value 1 m. = 39.37 in.

In. = / *Mm.* = / *Feet* = / *M.* = / *Yd.* = / *Miles* = / *Km.* =	*millimeters* / *inches*	*meters*	*feet*	*meters* / *yards*	*kilometers*	*miles*
51	1 295.40	2.007 87	15.544 8	167.323	46.634 5	55.774 2	82.076 7	31.689 9
52	1 320.80	2.047 24	15.849 6	170.603	47.548 9	56.867 8	83.686 1	32.311 2
53	1 346.20	2.086 61	16.154 4	173.884	48.463 3	57.961 4	85.295 4	32.932 6
54	1 371.60	2.125 98	16.549 2	177.165	49.377 7	59.055 0	86.904 7	33.554 0
55	1 397.00	2.165 35	16.764 0	180.446	50.292 1	60.148 6	88.514 1	34.175 3
56	1 422.40	2.204 72	17.068 8	183.727	51.206 5	61.242 2	90.123 4	34.796 7
57	1 447.80	2.244 09	17.373 6	187.008	52.120 9	62.335 8	91.732 8	35.418 1
58	1 473.20	2.283 46	17.678 4	190 288	53.035 3	63.429 4	93.342 1	36.039 5
59	1 498.60	2.322 83	17.983 2	193.569	53.949 7	64.523 1	94.951 5	36.660 8
60	1 524.00	2.362 20	18.288 0	196.850	54.864 1	65.616 7	96.560 8	37.282 2
61	1 549.40	2.401 57	18.592 8	200.131	55.778 5	66.710 3	98.170 2	37.903 6
62	1 574.80	2.440 94	18.897 6	203.412	56.692 9	67.803 9	99.779 5	38.524 9
63	1 600.20	2.480 31	19.202 4	206.693	57.607 3	68.897 5	101.389	39.146 3
64	1 625.60	2.519 68	19.507 2	209.973	58.521 7	69.991 1	102.998	39.767 7
65	1 651.00	2.559 05	19.812 0	213.254	59.436 1	71.084 7	104.608	40.389 0
66	1 676.40	2.598 42	20.116 8	216.535	60.350 5	72.178 3	106.217	41.010 4
67	1 701.80	2.637 79	20.421 6	219.816	61.264 9	73.271 9	107.826	41.631 8
68	1 727.20	2.677 16	20.726 4	223.097	62.179 3	74.365 6	109.436	42.253 2
69	1 752.60	2.716 53	21.031 2	226.378	63.093 7	75.459 2	111.045	42.874 5
70	1 778.00	2.755 90	21.336 0	229.658	64.008 1	76.552 8	112.654	43.495 9
71	1 803.40	2.795 27	21.640 8	232.939	64.922 5	77.646 4	114.264	44.117 3
72	1 828.80	2.834 64	21.945 6	236.220	65.836 9	78.740 0	115.873	44.738 6
73	1 854.20	2.874 01	22.250 4	239.501	66.751 3	79.833 6	117.482	45.360 0
74	1 879.60	2.913 38	22.555 2	242.782	67.665 7	80.927 2	119.092	45.981 4
75	1 905.00	2.952 75	22.860 0	246.063	68.580 1	82.020 8	120.701	46.602 7
76	1 930.40	2.992 12	23.164 8	249.343	69.494 5	83.114 4	122.310	47.224 1
77	1 955.80	3.031 49	23.469 6	252.624	70.408 9	84.208 1	123.920	47.845 5
78	1 981.20	3.070 86	23.774 4	255.905	71.323 3	85.301 7	125.529	48.466 9
79	2 006.60	3.110 23	24.079 2	259.186	72.237 7	86.395 3	127.138	49.088 2
80	2 032.00	3.149 60	24.384 0	262.467	73.152 1	87.488 9	128.748	49.709 6
81	2 057.40	3.188 97	24.688 8	265.748	74.066 5	88.582 5	130.357	50.331 0
82	2 082.80	3.228 34	24.993 6	269.028	74.981 0	89.676 1	131.966	50.952 3
83	2 108.20	3.267 71	25.298 4	272.309	75.895 4	90.769 7	133.576	51.573 7
84	2 133.60	3.307 08	25.603 3	275.590	76.809 8	91.863 3	135.185	52.195 1
85	2 159.00	3.346 45	25.908 1	278.871	77.724 2	92.956 9	136.795	52.816 4
86	2 184.40	3.385 82	26.212 9	282.152	78.638 6	94.050 6	138.404	53.437 8
87	2 209.80	3.425 19	26.517 7	285.433	79.553 0	95.144 2	140.013	54.059 2
88	2 235.20	3.464 56	26.822 5	288.713	80.467 4	96.237 8	141.623	54.680 6
89	2 260.60	3.503 93	27.127 3	291.994	81.381 8	97.331 4	143.232	55.301 9
90	2 286.00	3.543 30	27.432 1	295.275	82.296 2	98.425 0	144.841	55.923 3
91	2 311.40	3.582 67	27.736 9	298.556	83.210 6	99.518 6	146.451	56.544 7
92	2 336.80	3.622 04	28.041 7	301.837	84.125 0	100.612	148.060	57.160 0
93	2 362.20	3.661 41	28.346 5	305.118	85.039 4	101.706	149.669	57.787 4
94	2 387.60	3.700 78	28.651 3	308.398	85.953 8	102.799	151.279	58.408 8
95	2 413.00	3.740 15	28.956 1	311.679	86.868 2	103.893	152.888	59.030 1
96	2 438.40	3.779 52	29.260 9	314.960	87.782 6	104.987	154.497	59.651 5
97	2 463.80	3.818 89	29.565 7	318.241	88.697 0	106.080	156.107	60.272 9
98	2 489.20	3.858 26	29.870 5	321.522	89.611 4	107.174	157.716	60.894 3
99	2 514.60	3.897 63	30.175 3	324.803	90.525 8	108.268	159.325	61.515 6
100	2 540.01	3.937 00	30.480 1	328.083	91.440 2	109.361	160.935	62.137 0

From "Ready Reference Tables," courtesy Carl Hering.

TEMPERATURE CONVERSIONS

Albert Sauveur type of table. Look up reading in middle column; if in degrees Centigrade, read Fahrenheit equivalent in right hand column; if in degrees Fahrenheit, read Centigrade equivalent in left hand column.

−459.4 to 0			*0 to 100*						*100 to 1000*					
C		*F*	*C*		*F*	*C*		*F*	*C*		*F*	*C*		*F*
−273	*−459.4*		−17.8	*0*	32	10.0	*50*	122.0	38	*100*	212	260	*500*	932
−268	*−450*		−17.2	*1*	33.8	10.6	*51*	123.8	43	*110*	230	266	*510*	950
−262	*−440*		−16.7	*2*	35.6	11.1	*52*	125.6	49	*120*	248	271	*520*	968
−257	*−430*		−16.1	*3*	37.4	11.7	*53*	127.4	54	*130*	266	277	*530*	986
−251	*−420*		−15.6	*4*	39.2	12.2	*54*	129.2	60	*140*	284	282	*540*	1004
−246	*−410*		−15.0	*5*	41.0	12.8	*55*	131.0	66	*150*	302	288	*550*	1022
−240	*−400*		−14.4	*6*	42.8	13.3	*56*	132.8	71	*160*	320	293	*560*	1040
−234	*−390*		−13.9	*7*	44.6	13.9	*57*	134.6	77	*170*	338	299	*570*	1058
−229	*−380*		−13.3	*8*	46.4	14.4	*58*	136.4	82	*180*	356	304	*580*	1076
−223	*−370*		−12.8	*9*	48.2	15.0	*59*	138.2	88	*190*	374	310	*590*	1094
−218	*−360*		−12.2	*10*	50.0	15.6	*60*	140.0	93	*200*	392	316	*600*	1112
−212	*−350*		−11.7	*11*	51.8	16.1	*61*	141.8	99	*210*	410	321	*610*	1130
−207	*−340*		−11.1	*12*	53.6	16.7	*62*	143.6	100	*212*	413.6	327	*620*	1148
−201	*−330*		−10.6	*13*	55.4	17.2	*63*	145.4	104	*220*	428	332	*630*	1166
−196	*−320*		−10.0	*14*	57.2	17.8	*64*	147.2	110	*230*	446	338	*640*	1184
−190	*−310*		− 9.4	*15*	59.0	18.3	*65*	149.0	116	*240*	464	343	*650*	1202
−184	*−300*		− 8.9	*16*	60.8	18.9	*66*	150.8	121	*250*	482	349	*660*	1220
−179	*−290*		− 8.3	*17*	62.6	19.4	*67*	152.6	127	*260*	500	354	*670*	1238
−173	*−280*		− 7.8	*18*	64.4	20.0	*68*	154.4	132	*270*	518	360	*680*	1256
−169	*−273*	−459.4	− 7.2	*19*	66.2	20.6	*69*	156.2	138	*280*	536	366	*690*	1274
−168	*−270*	−454	− 6.7	*20*	68.0	21.1	*70*	158.0	143	*290*	554	371	*700*	1292
−162	*−260*	−436	− 6.1	*21*	69.8	21.7	*71*	159.8	149	*300*	572	377	*710*	1310
−157	*−250*	−418	− 5.6	*22*	71.6	22.2	*72*	161.6	154	*310*	590	382	*720*	1328
−151	*−240*	−400	− 5.0	*23*	73.4	22.8	*73*	163.4	160	*320*	608	388	*730*	1346
−146	*−230*	−382	− 4.4	*24*	75.2	23.3	*74*	165.2	166	*330*	626	393	*740*	1364
−140	*−220*	−364	− 3.9	*25*	77.0	23.9	*75*	167.0	171	*340*	644	399	*750*	1382
−134	*−210*	−346	− 3.3	*26*	78.8	24.4	*76*	168.8	177	*350*	662	404	*760*	1400
−129	*−200*	−328	− 2.8	*27*	80.6	25.0	*77*	170.6	182	*360*	680	410	*770*	1418
−123	*−190*	−310	− 2.2	*28*	82.4	25.6	*78*	172.4	188	*370*	698	416	*780*	1436
−118	*−180*	−292	− 1.7	*29*	84.2	26.1	*79*	174.2	193	*380*	716	421	*790*	1454
−112	*−170*	−274	− 1.1	*30*	86.0	26.7	*80*	176.0	199	*390*	734	427	*800*	1472
−107	*−160*	−256	− 0.6	*31*	87.8	27.2	*81*	177.8	204	*400*	752	432	*810*	1490
−101	*−150*	−238	0.0	*32*	89.6	27.8	*82*	179.6	210	*410*	770	438	*820*	1508
− 96	*−140*	−220	0.6	*33*	91.4	28.3	*83*	181.4	216	*420*	788	443	*830*	1526
− 90	*−130*	−202	1.1	*34*	93.2	28.9	*84*	183.2	221	*430*	806	449	*840*	1544
− 84	*−120*	−184	1.7	*35*	95.0	29.4	*85*	185.0	227	*440*	824	454	*850*	1562
− 79	*−110*	−166	2.2	*36*	96.8	30.0	*86*	186.8	232	*450*	842	460	*860*	1580
− 73	*−100*	−148	2.8	*37*	98.6	30.6	*87*	188.6	238	*460*	860	466	*870*	1598
− 68	− *90*	−130	3.3	*38*	100.4	31.1	*88*	190.4	243	*470*	878	471	*880*	1616
− 62	− *80*	−112	3.9	*39*	102.2	31.7	*89*	192.2	249	*480*	896	477	*890*	1634
− 57	− *70*	− 94	4.4	*40*	104.0	32.2	*90*	194.0	254	*490*	914	482	*900*	1652
− 51	− *60*	− 76	5.0	*41*	105.8	32.8	*91*	195.8				488	*910*	1670
− 46	− *50*	− 58	5.6	*42*	107.6	33.3	*92*	197.6				493	*920*	1688
− 40	− *40*	− 40	6.1	*43*	109.4	33.9	*93*	199.4				499	*930*	1706
− 34	− *30*	− 22	6.7	*44*	111.2	34.4	*94*	201.2				504	*940*	1724
− 29	− *20*	− 4	7.2	*45*	113.0	35.0	*95*	203.0				510	*950*	1742
− 23	− *10*	14	7.8	*46*	114.8	35.6	*96*	204.8				516	*960*	1760
− 17.8	*0*	32	8.3	*47*	116.6	36.1	*97*	206.6				521	*970*	1778
			8.9	*48*	118.4	36.7	*98*	208 4				527	*980*	1796
			9.4	*49*	120.2	37.2	*99*	210.2				532	*990*	1814
						37.8	*100*	212.0				538	*1000*	1832

TEMPERATURE CONVERSIONS
—Continued

1000 to 2000						2000 to 3000					
C		F	C		F	C		F	C		F
538	*1000*	1832	816	*1500*	2732	1093	*2000*	3632	1371	*2500*	4532
543	*1010*	1850	821	*1510*	2750	1099	*2010*	3650	1377	*2510*	4550
549	*1020*	1868	827	*1520*	2768	1104	*2020*	3668	1382	*2520*	4568
554	*1030*	1886	832	*1530*	2786	1110	*2030*	3686	1388	*2530*	4586
560	*1040*	1904	838	*1540*	2804	1116	*2040*	3704	1393	*2540*	4604
566	*1050*	1922	843	*1550*	2822	1121	*2050*	3722	1399	*2550*	4622
571	*1060*	1940	849	*1560*	2840	1127	*2060*	3740	1404	*2560*	4640
577	*1070*	1958	854	*1570*	2858	1132	*2070*	3758	1410	*2570*	4658
582	*1080*	1976	860	*1580*	2876	1138	*2080*	3776	1416	*2580*	4676
588	*1090*	1994	866	*1590*	2894	1143	*2090*	3794	1421	*2590*	4694
593	*1100*	2012	871	*1600*	2912	1149	*2100*	3812	1427	*2600*	4712
599	*1110*	2030	877	*1610*	2930	1154	*2110*	3830	1432	*2610*	4730
604	*1120*	2048	882	*1620*	2948	1160	*2120*	3848	1438	*2620*	4748
610	*1130*	2066	888	*1630*	2966	1166	*2130*	3866	1443	*2630*	4766
616	*1140*	2084	893	*1640*	2984	1171	*2140*	3884	1449	*2640*	4784
621	*1150*	2102	899	*1650*	3002	1177	*2150*	3902	1454	*2650*	4802
627	*1160*	2120	904	*1660*	3020	1182	*2160*	3920	1460	*2660*	4820
632	*1170*	2138	910	*1670*	3038	1188	*2170*	3938	1466	*2670*	4838
638	*1180*	2156	916	*1680*	3056	1193	*2180*	3956	1471	*2680*	4856
643	*1190*	2174	921	*1690*	3074	1199	*2190*	3974	1477	*2690*	4874
649	*1200*	2192	927	*1700*	3092	1204	*2200*	3992	1482	*2700*	4892
654	*1210*	2210	932	*1710*	3110	1210	*2210*	4010	1488	*2710*	4910
660	*1220*	2228	938	*1720*	3128	1216	*2220*	4028	1493	*2720*	4928
666	*1230*	2246	943	*1730*	3146	1221	*2230*	4046	1499	*2730*	4946
671	*1240*	2264	949	*1740*	3164	1227	*2240*	4064	1504	*2740*	4964
677	*1250*	2282	954	*1750*	3182	1232	*2250*	4082	1510	*2750*	4982
682	*1260*	2300	960	*1760*	3200	1238	*2260*	4100	1516	*2760*	5000
688	*1270*	2318	966	*1770*	3218	1243	*2270*	4118	1521	*2770*	5018
693	*1280*	2336	971	*1780*	3236	1249	*2280*	4136	1527	*2780*	5036
699	*1290*	2354	977	*1790*	3254	1254	*2290*	4154	1532	*2790*	5054
704	*1300*	2372	982	*1800*	3272	1260	*2300*	4172	1538	*2800*	5072
710	*1310*	2390	988	*1810*	3290	1266	*2310*	4190	1543	*2810*	5090
716	*1320*	2408	993	*1820*	3308	1271	*2320*	4208	1549	*2820*	5108
721	*1330*	2426	999	*1830*	3326	1277	*2330*	4226	1554	*2830*	5126
727	*1340*	2444	1004	*1840*	3344	1282	*2340*	4244	1560	*2840*	5144
732	*1350*	2462	1010	*1850*	3362	1288	*2350*	4262	1566	*2850*	5162
738	*1360*	2480	1016	*1860*	3380	1293	*2360*	4280	1571	*2860*	5180
743	*1370*	2498	1021	*1870*	3398	1299	*2370*	4298	1577	*2870*	5198
749	*1380*	2516	1027	*1880*	3416	1304	*2380*	4316	1582	*2880*	5216
754	*1390*	2534	1032	*1890*	3434	1310	*2390*	4334	1588	*2890*	5234
760	*1400*	2552	1038	*1900*	3452	1316	*2400*	4352	1593	*2900*	5252
766	*1410*	2570	1043	*1910*	3470	1321	*2410*	4370	1599	*2910*	5270
771	*1420*	2588	1049	*1920*	3488	1327	*2420*	4388	1604	*2920*	5288
777	*1430*	2606	1054	*1930*	3506	1332	*2430*	4406	1610	*2930*	5306
782	*1440*	2624	1060	*1940*	3524	1338	*2440*	4424	1616	*2940*	5324
788	*1450*	2642	1066	*1950*	3542	1343	*2450*	4442	1621	*2950*	5342
793	*1460*	2660	1071	*1960*	3560	1349	*2460*	4460	1627	*2960*	5360
799	*1470*	2678	1077	*1970*	3578	1354	*2470*	4478	1632	*2970*	5378
804	*1480*	2696	1082	*1980*	3596	1360	*2480*	4496	1638	*2980*	5396
810	*1490*	2714	1088	*1990*	3614	1366	*2490*	4514	1643	*2990*	5414
			1093	*2000*	3632				1649	*3000*	5432

APPROXIMATE HARDNESS CONVERSION NUMBERS FOR STEEL BASED ON ROCKWELL "C" HARDNESS NUMBERS

Rockwell C-Scale Hardness No.	*Brinell Hardness No. 10-mm Tungsten Carbide Ball, 3,000-Kg Load*	*ROCKWELL HARDNESS NO.*		*Diamond Pyramid Hardness No., Vickers*	*Shore Scleroscope Hardness No.*	*Tensile Strength (Approximate) in 1,000 psi*
		B-Scale, 100-Kg Load, 1/16-In. Diam. Ball	*A-Scale, 60-Kg Load, Brale Penetrator*			
68	—	—	85.6	940	97	—
67	—	—	85.0	900	95	—
66	—	—	84.5	865	92	—
65	739	—	83.9	832	91	—
64	722	—	83.4	800	88	—
63	705	—	82.8	772	87	—
62	688	—	82.3	746	85	—
61	670	—	81.8	720	83	—
60	654	—	81.2	697	81	—
59	634	—	80.7	674	80	326
58	615	—	80.1	653	78	315
57	595	—	79.6	633	76	305
56	577	—	79.0	613	75	295
55	560	—	78.5	595	74	287
54	543	—	78.0	577	72	278
53	525	—	77.4	560	71	269
52	512	—	76.8	544	69	262
51	496	—	76.3	528	68	253
50	481	—	75.9	513	67	245
49	469	—	75.2	498	66	239
48	455	—	74.7	484	64	232
47	443	—	74.1	471	63	225
46	432	—	73.6	458	62	219
45	421	—	73.1	446	60	212
44	409	—	72.5	434	58	206
43	400	—	72.0	423	57	201
42	390	—	71.5	412	56	196
41	381	—	70.9	402	55	191
40	371	—	70.4	392	54	186
39	362	—	69.9	382	52	181
38	353	—	69.4	372	51	176
37	344	—	68.9	363	50	172
36	336	(109.0)	68.4	354	49	168
35	327	(108.5)	67.9	345	48	163
34	319	(108.0)	67.4	336	47	159
33	311	(107.5)	66.8	327	46	154
32	301	(107.0)	66.3	318	44	150
31	294	(106.0)	65.8	310	43	146
30	286	(105.5)	65.3	302	42	142
29	279	(104.5)	64.7	294	41	138
28	271	(104.0)	64.3	286	41	134
27	264	(103.0)	63.8	279	40	131
26	258	(102.5)	63.3	272	38	127
25	253	(101.5)	62.8	266	38	124
24	247	(101.0)	62.4	260	37	121
23	243	100.0	62.0	254	36	118
22	237	99.0	61.5	248	35	115
21	231	98.5	61.0	243	35	113
20	226	97.8	60.5	238	34	110

NOTE. The values shown are based on ASTM Spec (E48) and 1954 SAE Handbook. Values in ( ) are beyond normal range and are given for information only.

APPROXIMATE HARDNESS CONVERSION NUMBERS FOR STEEL BASED ON BRINELL "C" HARDNESS NUMBERS

Brinell Indentation Diam. mm	Brinell Hardness No. 10-mm Tungsten Carbide Ball, 3,000-Kg Load	ROCKWELL HARDNESS No. C-Scale, 150-Kg Load, Brale Penetrator	ROCKWELL HARDNESS No. B-Scale, 100-Kg Load, 1/16-In. Diam. Ball	ROCKWELL HARDNESS No. A-Scale, 60-Kg Load, Brale Penetrator	Diamond Pyramid Hardness No. Vickers	Shore Scleroscope Hardness No.	Tensile Strength (Approximate) in 1,000 psi
2.25	745	65.3	—	84.1	840	91	—
—	733	64.7	—	83.8	820	90	—
—	722	64.0	—	83.4	800	88	—
2.30	712	—	—	—	—	—	—
—	710	63.3	—	83.0	780	87	—
—	698	62.5	—	82.6	760	86	—
—	684	61.8	—	82.2	740	—	—
2.35	682	61.7	—	82.2	737	84	—
—	670	61.0	—	81.8	720	83	—
—	656	60.1	—	81.3	700	—	—
2.40	653	60.0	—	81.2	697	81	—
—	647	59.7	—	81.1	690	—	—
—	638	59.2	—	80.8	680	80	329
—	630	58.8	—	80.6	670	—	324
2.45	627	58.7	—	80.5	667	79	323
	—	59.1	—	80.7	677	—	328
2.50	601	57.3	—	79.8	640	77	309
	—	57.3	—	79.8	640	—	309
2.55	578	56.0	—	79.1	615	75	297
	—	55.6	—	78.8	607	—	293
2.60	555	54.7	—	78.4	591	73	285
	—	54.0	—	78.0	579	—	279
2.65	534	53.5	—	77.8	569	71	274
	—	52.5	—	77.1	553	—	266
2.70	514	52.1	—	76.9	547	70	263
	—	51.6	—	76.7	539	—	259
2.75	—	51.1	—	76.4	530	—	254
	495	51.0	—	76.3	528	68	253
	—	50.3	—	75.9	516	—	247
2.80	—	49.6	—	75.6	508	—	243
	477	49.6	—	75.6	508	66	243
	—	48.8	—	75.1	495	—	237
2.85	—	48.5	—	74.9	491	—	235
	461	48.5	—	74.9	491	65	235
	—	47.2	—	74.3	474	—	226
2.90	—	47.1	—	74.2	472	—	225
	444	47.1	—	74.2	472	63	225
2.95	429	45.7	—	73.4	455	61	217
3.00	415	44.5	—	72.8	440	59	210
3.05	401	43.1	—	72.0	425	58	202
3.10	388	41.8	—	71.4	410	56	195
3.15	375	40.4	—	70.6	396	54	188
3.20	363	39.1	—	70.0	383	52	182
3.25	352	37.9	(110.0)	69.3	372	51	176
3.30	341	36.6	(109.0)	68.7	360	50	170
3.35	331	35.5	(108.5)	68.1	350	48	166
3.40	321	34.3	(108.0)	67.5	339	47	160
3.45	311	33.1	(107.5)	66.9	328	46	155
3.50	302	32.1	(107.0)	66.3	319	45	150
3.55	293	30.9	(106.0)	65.7	309	43	145
3.60	285	29.9	(105.5)	65.3	301	—	141
3.65	277	28.8	(104.5)	64.6	292	41	137
3.70	269	27.6	(104.0)	64.1	284	40	133
3.75	262	26.6	(103.0)	63.6	276	39	129
3.80	255	25.4	(102.0)	63.0	269	38	126
3.85	248	24.2	(101.0)	62.5	261	37	122
3.90	241	22.8	100.0	61.8	253	36	118
3.95	235	21.7	99.0	61.4	247	35	115
4.00	229	20.5	98.2	60.8	241	34	111
4.05	223	(18.8)	97.3	—	234	—	—
4.10	217	(17.5)	96.4	—	228	33	105
4.15	212	(16.0)	95.5	—	222	—	102
4.20	207	(15.2)	94.6	—	218	32	100
4.25	201	(13.8)	93.8	—	212	31	98
4.30	197	(12.7)	92.8	—	207	30	95
4.35	192	(11.5)	91.9	—	202	29	93
4.40	187	(10.0)	90.7	—	196	—	90
4.45	183	(9.0)	90.0	—	192	28	89
4.50	179	(8.0)	89.0	—	188	27	87
4.55	174	(6.4)	87.8	—	182	—	85
4.60	170	(5.4)	86.8	—	178	26	83
4.65	167	(4.4)	86.0	—	175	—	81
4.70	163	(3.3)	85.0	—	171	25	79
4.80	156	(0.9)	82.9	—	163	—	76
4.90	149	—	80.8	—	156	23	73
5.00	143	—	78.7	—	150	22	71
5.10	137	—	76.4	—	143	21	67
5.20	131	—	74.0	—	137	—	65

NOTE. The values shown are based on ASTM Spec. (E48) and 1954 SAE Handbook.
Values in ( ) are beyond normal range and are given for information only.

CIRCUMFERENCES AND AREAS OF CIRCLES

OF ONE INCH				OF INCHES OR FEET					
Fract.	Dec.	Circ.	Area	Dia.	Circ.	Area	Dia.	Circ.	Area
1/64	.015625	.04909	.00019	1	3.1416	.7854	64	201.06	3216.99
1/32	.03125	.09818	.00077	2	6.2832	3.1416	65	204.20	3318.31
3/64	.046875	.14726	.00173	3	9.4248	7.0686	66	207.34	3421.19
1/16	.0625	.19635	.00307	4	12.5664	12.5664	67	210.49	3525.65
5/64	.078125	.24545	.00479	5	15.7080	19.635	68	213.63	3631.68
3/32	.09375	.29452	.00690	6	18.850	28.274	69	216.77	3739.28
7/64	.109375	.34363	.00939	7	21.991	38.485	70	219.91	3848.45
1/8	.125	.39270	.01227	8	25.133	50.266	71	223.05	3959.19
9/64	.140625	.44181	.01553	9	28.274	63.617	72	226.19	4071.50
5/32	.15625	.49087	.01917	10	31.416	78.540	73	229.34	4185.39
11/64	.171875	.53999	.02320	11	34.558	95.033	74	232.48	4300.84
3/16	.1875	.58905	.02761	12	37.699	113.1	75	235.62	4417.86
13/64	.203125	.63817	.03241	13	40.841	132.73	76	238.76	4536.46
7/32	.21875	.68722	.03758	14	43.982	153.94	77	241.90	4656.63
15/64	.234375	.73635	.04314	15	47.124	176.71	78	245.04	4778.36
1/4	.25	.78540	.04909	16	50.265	201.06	79	248.19	4901.67
17/64	.265625	.83453	.05542	17	53.407	226.98	80	251.33	5026.55
9/32	.28125	.88357	.06213	18	56.549	254.47	81	254.47	5153.
19/64	.296875	.93271	.06922	19	59.690	283.53	82	257.61	5281.02
5/16	.3125	.98175	.07670	20	62.832	314.16	83	260.75	5410.61
21/64	.328125	1.0309	.08456	21	65.973	346.36	84	263.89	5541.77
11/32	.34375	1.0799	.09281	22	69.115	380.13	85	267.04	5674.50
23/64	.359375	1.1291	.10144	23	72.257	415.48	86	270.18	5808.80
3/8	.375	1.1781	.11045	24	75.398	452.39	87	273.32	5944.68
25/64	.390625	1.2273	.11984	25	79.540	490.87	88	276.46	6082.12
13/32	.40625	1.2763	.12962	26	81.681	530.93	89	279.60	6221.14
27/64	.421875	1.3254	.13979	27	84.823	572.56	90	282.74	6361.73
7/16	.4375	1.3744	.15033	28	87.965	615.75	91	285.88	6503.88
29/64	.453125	1.4236	.16126	29	91.106	660.52	92	289.03	6647.61
15/32	.46875	1.4726	.17257	30	94.248	706.86	93	292.17	6792.91
31/64	.484375	1.5218	.18427	31	97.389	754.77	94	295.31	6939.78
1/2	.5	1.5708	.19635	32	100.53	804.25	95	298.45	7088.22
33/64	.515625	1.6199	.20880	33	103.67	855.30	96	301.59	7238.23
17/32	.53125	1.6690	.22166	34	106.81	907.92	97	304.73	7339.81
35/64	.546875	1.7181	.23489	35	109.96	962.11	98	307.88	7542.96
9/16	.5625	1.7671	.24850	36	113.10	1017.88	99	311.02	7697.69
37/64	.578125	1.8163	.26248	37	116.24	1075.21	100	314.16	7953.98
19/32	.59375	1.8653	.27688	38	119.38	1134.11	101	317.30	8011.85
39/64	.609375	1.9145	.29164	39	122.52	1194.59	102	320.44	8171.28
5/8	.625	1.9635	.30680	40	125.66	1256.64	103	323.58	8332.29
41/64	.640625	2.0127	.32232	41	128.81	1320.25	104	326.73	8494.87
21/32	.65625	2.0617	.33824	42	131.95	1385.44	105	329.87	8659.01
43/64	.671875	2.1108	.35453	43	135.09	1452.20	106	333.01	8824.73
11/16	.6875	2.1598	.37122	44	138.23	1520.53	107	336.15	8992.02
45/64	.703125	2.2090	.38828	45	141.37	1590.43	108	339.29	9160.88
23/32	.71875	2.2580	.40574	46	144.51	1661.90	109	342.43	9331.32
47/64	.734375	2.3072	.42356	47	147.65	1734.94	110	345.58	9503.32
3/4	.75	2.3562	.44179	48	150.80	1809.56	111	348.72	9676.89
49/64	.765625	2.4054	.45253	49	153.94	1885.74	112	351.86	9852.03
25/32	.78125	2.4544	.47937	50	157.08	1963.50	113	355.	10028.75
51/64	.796875	2.5036	.49872	51	160.22	2042.82	114	358.14	10207.03
13/16	.8125	2.5525	.51849	52	163.36	2123.72	115	361.28	10386.89
53/64	.828125	2.6017	.53862	53	166.50	2206.18	116	364.42	10568.32
27/32	.84375	2.6507	.55914	54	169.65	2290.22	117	367.57	10751.32
55/64	.859375	2.6999	.58003	55	172.79	2375.83	118	370.71	10935.88
7/8	.875	2.7489	.60132	56	175.93	2463.01	119	373.85	11122.02
57/64	.890625	2.7981	.62298	57	179.07	2551.76	120	377.99	11309.73
29/32	.90625	2.8471	.64504	58	182.21	2642.08	121	380.13	11499.01
59/64	.921875	2.8963	.66746	59	185.35	2733.97	122	383.27	11689.87
15/16	.9375	2.9452	.69029	60	188.50	2827.43	123	386.42	11882.29
61/64	.953125	2.9945	.71349	61	191.64	2922.47	124	389.56	12076.28
31/32	.96875	3.0434	.73708	62	194.78	3019.07	125	392.70	12271.85
63/64	.984375	3.0928	.76097	63	197.20	3117.25	126	395.84	12468.98

REZISTAL STAINLESS STEEL WIRE

The following tables have been compiled to indicate the weight variations in the different grades of stainless steel wire.

REZISTAL 304 Density .287 (lb./cu. in.)			REZISTAL 410 Density .278 (lb./cu. in.)		
Diameter Inches	*Pounds per Foot*	*Feet per Pound*	*Diameter Inches*	*Pounds per Foot*	*Feet per Pound*
.002	.0000108	92,593	.002	.0000105	96,154
.003	.0000243	41,152	.003	.0000236	42,372
.004	.000043	23,256	.004	.000042	23,810
.005	.000068	14,706	.005	.000066	15,152
.006	.000097	10,309	.006	.000094	10,638
.007	.000133	7,519	.007	.000128	7,813
.008	.000173	5,780	.008	.000168	5,952
.009	.000219	4,566	.009	.000212	4,722
.010	.000270	3,703	.010	.000262	3,817
.011	.000327	3,058	.011	.000317	3,154
.012	.000389	2,570	.012	.000377	2,652
.013	.000457	2,188	.013	.000443	2,257
.014	.000530	1,888	.014	.000513	1,949
.015	.000608	1,644	.015	.000589	1,698
.016	.000692	1,445	.016	.000671	1,490
.017	.000781	1,280	.017	.000757	1,321
.018	.000876	1,141	.018	.000849	1,177
.019	.000976	1,024	.019	.000946	1,057
.020	.001081	925	.020	.001048	954
.021	.001192	839	.021	.001155	866
.022	.001309	764	.022	.001268	788
.023	.001430	699	.023	.001386	721
.024	.001558	642	.024	.001509	662
.025	.001690	592	.025	.001637	611
.026	.001828	547	.026	.001771	564
.027	.001971	507	.027	.001910	523
.028	.002120	472	.028	.002054	487
.029	.002274	440	.029	.002203	454
.030	.002434	411	.030	.002358	424
.031	.002599	385	.031	.002517	397
.032	.002769	361	.032	.002682	373
.033	.002945	340	.033	.002853	351
.034	.003126	320	.034	.003028	330
.035	.003313	302	.035	.003209	312
.036	.003505	285	.036	.003395	295
.037	.003703	270	.037	.003586	279

REZISTAL STAINLESS STEEL WIRE—*Continued*

REZISTAL 304 Density .287 (lb./cu. in.)			REZISTAL 410 Density .278 (lb./cu. in.)		
Diameter Inches	*Pounds per Foot*	*Feet per Pound*	*Diameter Inches*	*Pounds per Foot*	*Feet per Pound*
.038	.003905	256	.038	.003783	264
.039	.004114	243	.039	.003985	251
.040	.004327	231	.040	.004192	239
.041	.004546	220	.041	.004404	227
.042	.004771	210	.042	.004621	216
.043	.005001	200	.043	.004844	206
.044	.005236	191	.044	.005072	197
.045	.005477	183	.045	.005305	189
.046	.005723	175	.046	.005544	180
.047	.005975	167	.047	.005787	173
.048	.006232	160	.048	.006036	166
.049	.006494	154	.049	.006290	159
.050	.006762	148	.050	.006550	152
.051	.007035	142	.051	.006814	146
.052	.007314	137	.052	.007084	141
.053	.007598	132	.053	.007359	136
.054	.007887	127	.054	.007640	131
.055	.008182	122	.055	.007925	126
.056	.008482	118	.056	.008216	122
.057	.008788	114	.057	.008512	117
.058	.009099	110	.058	.008813	113
.059	.009415	106	.059	.009120	109
.060	.009737	103	.060	.009432	106
.061	.010064	99	.061	.009749	103
.062	.010397	96	.062	.010071	99
.063	.010735	93	.063	.010399	96
.064	.011079	90	.064	.010731	93
.065	.011428	88	.065	.011069	90
.066	.011782	85	.066	.011413	88
.067	.012142	82	.067	.011761	85
.068	.012507	80	.068	.012115	83
.069	.012878	78	.069	.012474	80
.070	.013254	75	.070	.012838	78
.071	.013635	73	.071	.013207	76
.072	.014022	71	.072	.013582	74
.073	.014414	69	.073	.013962	71

USEFUL INFORMATION

To find circumference of a circle multiply diameter by 3.1416.

To find diameter of a circle multiply circumference by .31831.

To find area of a circle multiply square of diameter by .7854.

Area of rectangle. Length multiplied by breadth. Doubling the diameter of a circle increases its area four times.

To find area of a triangle multiply base by ½ perpendicular height.

To find surface of a ball multiply square of diameter by 3.1416.

To find side of an inscribed square multiply diameter by 0.7071 or multiply circumference by 0.2251 or divide circumference by 4.4428.

To find side of an equal square multiply diameter by .8862.

Square. A side multiplied by 1.4142 equals diameter of its circumscribing circle.

A side multiplied by 4.443 equals circumference of its circumscribing circle.

A side multiplied by 1.128 equals diameter of an equal circle.

A side multiplied by 3.547 equals circumference of an equal circle.

Square inches multiplied by 1.273 equals circle inches of an equal circle.

To find cubic inches in a ball multiply cube of diameter by .5236.

To find cubic contents of a cone, multiply area of base by ⅓ the altitude.

Doubling the diameter of a pipe increases its capacity four times.

A gallon of water (U. S. Standard) weighs 8⅓ lb. and contains 231 cubic inches.

USEFUL INFORMATION—*Continued*

A cubic foot of water contains 7½ gallons, 1728 cubic inches, and weighs 62½ lb.

To find the pressure in pounds per square inch of a column of water multiply the height of the column in feet by .434.

Steam rising from water at its boiling point 212 (degrees) has a pressure equal to the atmosphere (14.7) lb. to the square inch.

A standard horsepower:—The evaporation of 30 lb. of water per hour from a feed water temperature of 100 F. into steam at 70 lb. gauge pressure.

To find capacity of tanks any size: given dimensions of a cylinder in inches, to find its capacity in U. S. gallons: square the diameter, multiply by the length and by .0034.

To ascertain heating surface in tubular boilers, multiply ⅔ the circumference of boiler by length of boiler in inches and add to it the area of all the tubes.

One-sixth of tensile strength of plate multiplied by thickness of plate and divided by one-half the diameter of boiler gives safe working pressure for tubular boilers. For marine boilers add 20 per cent for drilled holes.

To find the capacity of an air compressor in cubic feet of free air per minute: Multiply the area of low pressure cylinder (on compound compressor), or area of simple compressor cylinder in square inches, by the stroke in inches and divide by 1728; and multiply this result—

(a) In single acting, simple or compound, by the R.P.M.
(b) Double acting, simple or compound, by 2 x R.P.M.
(c) Duplex double acting, by 4 x R.P.M.

●

We hope that the information in this stock book has been found useful, valuable and informative. In the event there remain questions unanswered, a request for further information will be promptly answered.

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